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Medical Times

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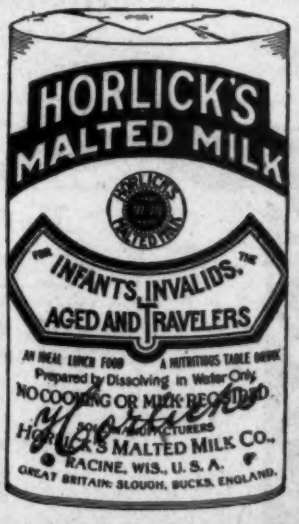
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General Scientific

THE VALUE OF OPAQUE MATERIALS IN UROLOGICAL DIAGNOSIS.*

NATHANIEL P. RATHBUN, M. D., F. A. C. S.
Brooklyn.

There are few departments, if any, so important in our profession as diagnosis. With an accurate diagnosis established, a course of treatment is easily carried out, the general plan of which may be read in any book. The real crux of the situation more often than not rests on a diagnosis.

In the practice of urology we find some cases in which the symptoms are so classical and the physical signs so obvious that the diagnosis is practically "hand-picked." More frequently, however, a diagnosis can only be reached after days and weeks of painstaking investigation and study. And then, having made a diagnosis which is correct beyond peradventure of a doubt, it behooves us to check up our findings with every available means at our command. It is only in that way that we can avoid serious errors. There is nothing more embarrassing than to cut down upon a supposed renal calculus in the presence of several interested visitors and critical internes, and expose a normal kidney. I am willing to confess that I have made this error and I believe that most other operators, if they are honest, will acknowledge a similar experience. However, such an incident, with our ever increasing facilities for controlling our diagnosis, must becom more and more unusual in the experience of a careful man.

The symptoms presented, and even the physical signs in some of our cases are very misleading. To illustrate: A woman may present herself with a perfectly classical history of right renal colic; a radiograph may show her to have a shadow apparently in the right ureter. It would seem reasonable to assume that the woman had a renal calculus. Yet careful study—the checking-up process—may demonstrate that the shadow is two inches from the ureter, and that her trouble may be caused by a chronically inflamed appendix, a tube, or a small ovarian cyst, with a twisted pedicle, and that the shadow was caused by a calcified gland. Conversely a man may present himself complaining of digestive disturbances and loss of weight. Here a careful examination might reveal a renal tuberculosis. These are not altogether hypothetical cases. I have seen them paralleled not infrequently in my own practice.

Since the advent of the cystoscope and the x-ray there have been no more valuable additions to our diagnostic armamentarium than the opaque ureteral catheter and opaque solutions injected into the bladder and pelvis of the kidney, both, of course, employed in conjunction with the cystoscope and the *x*-ray. In most instances they serve the purpose of checking up a diagnosis made reasonably sure by other means. In many instances they offer the only method of making a diagnosis. The use of ureter catheters opaque to the *x*-ray dates back practically to the employment of the *x*-ray in urology. At first an ordinary catheter was used in conjunction with a metal stylet. Now we have a silk elastic catheter impregnated with lead. This has the same appearance and consistency as the ordinary catheter, and does not traumatize the delicate structures through which it passes. With this alone we are able to demonstrate the position of the kidney and the course of the ureter. I have been much interested to note the extreme variation in the course of the normal ureter. We are also able to demonstrate clearly whether or not suspicious shadows apparently in the ureter really are there or are remote from it.

Cystography and pyelography—more particularly the latter—are developments of a later date, and much credit is due to Brasch of the Mayo clinic for developing it. The problem that presented was to find some substance opaque to the *x*-ray, easily handled, not too expensive, freely soluble in water and therefore in the urine, and unirritating to the kidney. In the beginning we used the various organic silver salts, more particularly collargol. This is very dense to the *x*-ray, but it is difficult to handle, and disagreeable because of its syrupy consistency, and because it stains the hands and clothing, and, what is of greater importance, it is sometimes irritating to the kidney, and a few fatal cases have been reported from its use. Autopsy in some of these cases showed that the collargol had passed through the mucous membrane of the kidney pelvis into the parenchyma. At present we seem to have the ideal substance in thorium nitrate, 10 per cent. solution for the bladder

*Read at meeting of Second District Branch, New York, Medical Society.

Fig. 1. Illustrating variation in course of ureters on two sides in the same patient.

Fig. 2. Cystogram of tabectic bladder showing many trabeculations and dilation of right ureter with incompetent ureterovesical valve.

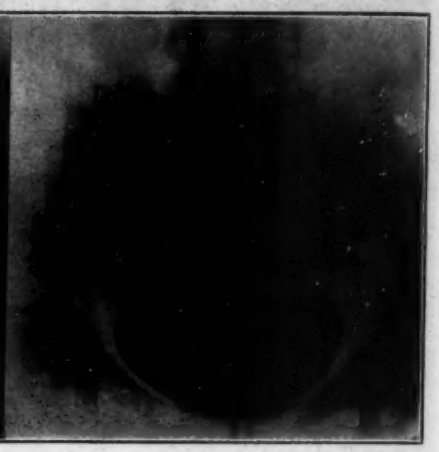

Fig. 3. Cystogram of normal bladder.

and 15 per cent. for the kidney pelvis. These solutions have the appearance and consistency of water and thus are very readily handled. It is nearly, if not quite, as opaque to the *x*-ray as collargol, and so far as I know it is entirely devoid of any deleterious effect upon the kidney when employed with care. I have injected nearly one hundred kidney pelves with thorium, and with one single exception have seen no ill effect. This one exception was a woman who had a rather severe renal colic immediately after the injection requiring a full dose of morphia for its relief. She was all right the next day and had no sequelae.

Technique: The patient is prepared as for any radiograph of the urinary tract; that is, the colon is thoroughly cleared of gas and feces by purgatives and enemata. For bladder pictures a soft rubber catheter is passed into the viscus, the urine drawn off, the bladder washed with boric acid solution, and the thorium permitted to run into the bladder until the patient feels that the bladder is full, perhaps going a little beyond the point where the patient complains of a sense of fulness, in order that the bladder may be well distended. The amount varies of course in different cases. The picture is then snapped from one or more different angles; the thorium is drawn off, the bladder is once more irrigated with the boric acid solution, leaving a few ounces in situ, and the operation is complete.

For pyelography, the technique in the beginning is identical with cystoscopy and ureter catheterization done for other purposes except I believe it is advisable to use an *x*-ray catheter. The catheter is passed into the ureter on the side which is being investigated, the bladder emptied and the cystoscope withdrawn in the usual manner, leaving the catheter in the ureter. In my early cases, it was my custom to have the picture made while I held the cystoscope in position. In this way I subjected myself to much useless trouble, and was exposed to much unnecessary *x*-ray therapy. I was fearful of dragging the catheter too far down the ureter to permit of injecting the kidney pelvis. I found, however, that with the catheter only a few inches in the ureter, the solution flowed into the pelvis of the kidney very readily, and gave me a good picture.

If so desired, one may at the same sitting secure a specimen of urine and do a function test upon the kidney under consideration. The patient is now placed in

Fig. 4. Normal kidney pelvis. Rather large kidney, but outline of pelvis and calyces normal.

Fig. 5. Calculus in lower calyx of kidney. This did not show in simple radiograph.

Fig. 6. Mild hydronephrosis.

Fig. 7. Early renal tuberculosis. Note elongated rigid wall of pe...s and snubbing of minor calyces. Nephrectomy diagnosis confirmed.

Fig. 8. Intra-renal hydronephrosis with multiple calculi. Note small pelvis, but numerous cavities in lower pole of kidney. Nephrectomy.

Fig. 9. Kidney ptosed and rotated. Patient has pain and much diminished function. Declines operation.

position for the picture, and the plates adjusted. A Luer syringe is now connected with the open end of the catheter and the thorium solution allowed to run in by gravity, the amount required in my series of cases ranged from 3 to 70 c.c., the average taking about 8 c.c. We are not likely to do any damage if gravity is the only force employed. The amount injected is gauged by two factors—pain, and the rate of flow. Any complaint of pain referred to the kidney region is an imperative signal to stop. If the patient does not complain of pain and the fluid is flowing rapidly we may continue the injection, as I did in one of my cases, up to 70 c.c. or more. The syringe is now removed, the catheter plugged, and two or more exposures made upon a plate which includes the kidney and ureter regions. I believe the patient should remain upon the same table for his cystoscopy and radiograph. I think it unwise to move a patient about with a catheter in his ureter much less with a foreign body in his kidney. At the Brooklyn Hospital our cystoscopy room immediately adjoins the *x*-ray room and when the cystoscopy manipulations are completed the table with the patient upon it is wheeled under the tube and the exposures made.

Until recently I have hesitated to inject both kidneys simultaneously. However, in the past few months I have done that in a few cases, and have seen no untoward effects, and I shall doubtless do more in the future since the comparison of the two kidneys on the same plate is of great value.

We now come to the most difficult part of the entire subject, and that is the proper interpretation of the plates. Most of us find ourselves in the position of the gastro-enterologists a few years ago in their relation to the radiograph. We see many strange and varied pictures. In many cases the evidence presented is readily interpreted while in other instances the shadows are very difficult to understand. Like the colon, the normal kidney pelvis exhibits many variations, and it is only by studying a large number of pictures and checking them up with operative findings that we may hope to become proficient in the interpretation of pyelograms.

We may look for and determine the course of the ureter, the presence of strictures, kinks, dilatations, etc. We note the position of the kidney, the size, shape, and contour of the kidney pelvis, the outline of the major and minor calices, the presence of abnormal cavities in the kidney parenchyma, and filling defects in the kidney pelvis.

I shall try to illustrate these points with a few slides.

The whole subject is a fascinating one for study, and we are learning more about it every day. Like all other diagnostic refinements, it must be considered in connection with the history and other physical signs. Very often it proves an almost indispensable aid to diagnosis.

67 Hanson Place.

DOUBLE, RECURRENT AND BILATERAL TUBAL PREGNANCIES.

An Analysis of 89 Cases Reported in the Literature and 3 Unpublished Personal Cases.

AIME PAUL HEINECK, M. D.,
Chicago.

Extra-uterine pregnancy is one of the most important maladies of the child-bearing period. It occurs in all races, appears to be less frequent in the colored, "4 negresses in 169 cases." The condition, though more frequently recognized than heretofore is, nevertheless, often overlooked, misdiagnosed and, therefore, mistreated. A more complete understanding of tubal gestation will lead to the saving of lives and to the prevention of invalidism.

Tubal gestation, by far the most common variety of ectopic pregnancy, is single, double, or multiple; unilateral or bilateral. It may be a woman's first and last conception; it may be preceded by a long period of infertility; it may end a woman's child-bearing career. Tubal pregnancy may co-exist with a uterine pregnancy. It can occur in the absence of other pathological states of the pelvic or other organs. Its occurrence in one tube does not protect against its occurrence in the opposite tube, does not absolutely protect against its recurrence in the same tube.

To facilitate the task of future investigators, I have collected, studied and analyzed all cases of double and bilateral tubal pregnancies reported with sufficient data in the English, French and German literature from 1908 to 1916, inclusive. Only original reports of cases in

which the diagnosis was verified at operation were considered.

Double tubal pregnancies are almost invariably bilateral; exceptionally unilateral.

Double and bilateral tubal pregnancies are either simultaneous or recurrent. If simultaneous, both conceptions begin at or about the same time; both gestations may develop, or one may be interrupted and the other continue. Usually the two fetal cysts differ in size and destiny. The recurrent type is by far the most frequent (63 cases). Almost always the recurrence is in the opposite tube.

Double and bilateral tubal pregnancies can occur at any period of the child-bearing age. We do not know how often tubal pregnancy recurs; we do not know why it occurs. Authors are not agreed as to the frequency of recurrence.

One ectopic pregnancy is not necessarily followed by another ectopic pregnancy. Normal pregnancies may be sandwiched in between two extra-uterine gestations.

Months, or even years, may elapse between the incidence of pregnancy in one tube and the lodgment of an impregnated ovum in the opposite tube.

In our collected cases the interval between the two tubal gestations varied from three months to nine years.

Double, recurrent and bilateral tubal pregnancies occurred in women who have never borne living children. Tubal pregnancy has recurred in women who have borne one living child, two children, three children, four children, five children and six children.

Double, recurrent and bilateral tubal pregnancies like other varieties of ectopic gestation not infrequently occur in women who, though frequently exposed to pregnancy, have remained sterile.

The cause of tubal pregnancy, whether single, double or recurrent, is not definitely known. No causative factor present in every case has been demonstrated. Not uncommonly, co-existing pathological states are found. Are these pathological states coincidental or etiologic factors? With the data at hand, a positive answer is not possible.

Inflammatory and other degenerative changes of the tubal wall do not possess the important etiological role formerly attributed to them. Though all conditions that obstruct, delay or hinder the progress of the impregnated ovum to the uterus favor the occurrence of ectopic gestation, still many cases occur in which, the existing tubal gestation excepted, there is a total absence of pathological tubal or ovarian changes, congenital or acquired. Actual examination at time of operation has firmly established the fact that an inflammatory condition is not present in all cases.

It has been believed that the predominant cause of tubal pregnancy is salpingitis, post-abortum, post partum or gonorrheal in nature, with resulting destruction of the tubal ciliated epithelium. "I have been able to demonstrate the presence of cilia in nearly every pregnant tube which I have examined," Williams. In some cases, the presence of co-existing pelvic pathological states is recorded, cyst of parovarium, ovarian cyst, polycystic degeneration of left ovary.

All our collected and personal cases were primarily either interstitial, isthmic, or ampullary. All the others were bilateral. These 92 cases represent 185 tubal gestations. Not one of these pregnancies, either first or second, went to full term.

Sixteen gestations were subjected to operative relief previous to tubal abortion or tubal rupture. Thirty-two tubal gestations terminated in abortion; seventy-five in rupture. In the remaining cases the termination is either not recorded or not definitely stated. Termination depends in great part upon the implantation site of the ovum, thus in the isthmic form, this portion of the tube not admitting of much distention, early rupture is the rule. In the ampullary form, the tubal wall offering less resistance in the ampullary region to the growth of the ovum, abortion is the rule. Tubal abortions are due to rupture through the capsular membrane; they are incomplete, or complete; incomplete being the more common. Complete tubal abortion implies complete expulsion of the ovum, membrane and contents, into the peritoneal cavity by way of the abdominal ostium of tube. In complete abortion, the hemorrhage is usually slight. In the incomplete type, there is a partial loosening of the ovum from the tubal wall and only parts of the ovum pass into the peritoneal cavity. In incomplete tubal abortion the hemorrhages recur as evidenced by repeated colicky pains, laminated clots, etc. Tubal abortion has been appropriately designated by some authors as intra-tubal rupture.

Rupture, extra-tubal, occurs at or near the placental site, taking place either into the peritoneal cavity or between the folds of the broad ligament. Primary rupture of the ovum, in by far the larger number of cases, occurs previous to or about the eighth week; in a few cases it occurs later.

It may involve any portion of the tube, isthmic, middle third, ampullary, and vary in size from a pin-point to a tearing asunder of the entire tube. Even a pin-point rupture may cause a fatal hemorrhage. In the only case of this series in which hemorrhage apparently caused death, the rupture was a small orifice on the free portion of tube through which chorionic villi projected. The tubal tissues in contact with the ovum offer slight resistance to the fetal elements; being early invaded by the chorionic villi and fetal cells they soon undergo degenerative changes. The tubal wall is weakened partly by the continuous and gradually increasing distention exerted by the growing ovum and much more so by the erosive action of the fetal elements upon the maternal tissues. The tubal resistance being thus impaired, rupture is easily brought about either by direct perforation by the growing villi or by any sudden access of pressure, such as is determined by the sudden opening of a large vessel, by the clogging of venous channels, or by slight external violence as vaginal examination, coitus, fall, etc.

Bilateral tubal gestation may terminate in tubal rupture in one tube and in tubal abortion in the other.

Tubal abortion and tubal rupture, be the latter intra or extra-tubal, are associated with moderate or profuse internal hemorrhage, either in the lumen of the Fallopian tube, between the folds of the broad ligament or into the peritoneal cavity.

When hemorrhage takes place into the free peritoneal cavity, a practically limitless space, the patient may bleed to death without a drop of blood appearing externally. Blood extravasated in the lumen of the tube, between the folds of the broad ligament or in the peritoneal cavity, either undergoes absorption, coagulation, organization, cyst-formation, or suppuration.

Fate of the Ovum.

The ovum lodged in a tube being always poorly fixed, poorly nourished; most tubal pregnancies come to an end previous to the eighth week. When tubal gestation ends this early, be the termination due to ovular apoplexy, tubal abortion or tubal rupture, the ovum is absorbed. This is the fate of young embryos extruded into the peritoneal cavity, if they be not removed by the surgeon. When, after tubal abortion or tubal rupture, the placenta retains some tubal implantation and con-

tracts new attachments to the pelvic wall, rectum or other viscus or viscera, the placental circulation thereby continuing, the pregnancy becomes tubo-abdominal or tubo-peritoneal in type. Absorption is more difficult after the third month.

In many operations for early tubal gestation the embryo is found in the tube or in the abdominal or peritoneal cavities. Ovular debris, placenta, decidual cells, fetal rests, chorionic villi, etc., are more frequently found at time of operation than fetuses.

The symptoms of tubal gestation, like those of uterine gestation, can be classified into presumptive, probable and positive. The positive symptoms of pregnancy, fetal heart sounds, active and passive fetal movements, palpation of fetal parts, are usually not detected until after the fourth month of gestation. Now as 81 per cent. of tubal gestations terminate before, at or about their eighth week, it can be seen that the positive signs of tubal pregnancy corresponding to the positive signs of uterine pregnancy, are rarely present and, therefore, rarely detected. In not one of our cases were any of the positive signs of pregnancy present.

Previous to tubal abortion and to tubal rupture, presumptive signs of pregnancy, such as amenorrhea, nausea and vomiting, bluish discoloration of vaginal walls, pigmentation and striae, urinary disturbances, were noted in many of the cases. Amenorrhea is so constant a symptom in tubal pregnancy that its absence is misleading.

Other presumptive symptoms, such as nausea and vomiting, colostrum secretion, milk secretion, bluish discoloration of the vaginal wall, enlargement of breasts, etc., are less frequently recorded.

Among the probable signs, the most frequently noted in our series were changes in size, consistency and position of the uterus. "The existence of an enlarged uterus at any time during the child-bearing period should be regarded as presumptive evidence of pregnancy until such a possibility has been conclusively eliminated," Williams.

The most characteristic symptoms that confront the clinician are those determined by tubal rupture or by tubal abortion. Both of these accidents are associated with pain and with internal hemorrhage, the extent of which determines the gravity of the case. Very often the patient first comes into the hands of the physician some time after she has recovered from the primary shock due to tubal rupture or tubal abortion.

In tubal abortion there may be acute, severe, cramp-like pain, limited to the pelvic region or referred to other portions of the abdomen; there may be absence of pain. In many cases of tubal abortion about the only symptom we have is abdominal pain and uterine colic preceding and accompanying the expulsion of the decidual cast. In tubal rupture the pain is intense, agonizing, may cause the patient's collapse. It is most marked in the lower abdomen and may be referred to the right side, to the left side, to the right kidney region, to the rectum, epigastrium, umbilicus.

Coincident with the lodgment and development of the ovum, the uterus, during the first three months of tubal gestation, undergoes hypertrophy and its endometrium becomes converted into a decidua similar to that observed in uterine pregnancy. Soon after the death of the fetus, the decidua is thrown off, being expelled in shreds, or as a triangular cast of the uterine cavity, with dimensions corresponding to that of the hypertrophied uterus.

Though tubal pregnancy and especially bilateral tubal pregnancy are frequently operative discoveries, the diagnosis being rarely made previous to tubal abortion or tubal rupture, the following symptoms, taken in conjunction with a suggestive history and suggestive pelvic findings, should make one think of the possible existence of tubal gestation.

a. Presence of the presumptive symptoms and signs of pregnancy: Morning sickness, milk and colostrum secretion, pelvic pains referable to bladder and rectum.

b. Cessation of the menses.

c. Bluish discoloration of the vaginal wall.

d. Softening of the cervix.

e. Changes in size, consistency and position of uterus.

The existence of ectopic pregnancy is highly probable, when, in association with the above, palpation reveals an indefinitely outlined tender, boggy mass to one or both sides of uterus, in a patient who has or has had symptoms of acute anemia and attacks of acute abdominal pain, especially if the abdominal tumor has increased in size with each attack of abdominal pain.

If, during an intermenstrual period with or without a suppression of the menses, a woman has an attack of severe abdominal pain followed by vomiting, collapse, slight uterine hemorrhage, think of tubal abortion. If after a few days or a few weeks the same clinical picture recurs, suspect the existence of a bilateral tubal pregnancy.

The severe pain of tubal rupture is accompanied or followed by symptoms of abdominal hemorrhage and acute anemia, pallor, dizziness, nausea, collapse, weak thready pulse. In almost all cases associated with the above vaginal hemorrhage, varying in amount, slight, or profuse, and in duration from 3 weeks to 6 weeks, is said to have been present. These attacks of pain, vaginal hemorrhage and anemia may be repeated.

The treatment of ectopic gestation previous to, at time of, or after tubal rupture or abortion is operative. As stated in some of our previous publications on this subject, we disregard completely the life of the ectopic fetus and concentrate our efforts to saving the maternal health and the maternal life. The ectopic fetus, in all its various forms and at all periods of its existence, is a menace to the maternal organism. Operation removes in a few minutes what it will require unaided nature, even in the most favorable cases, a long time to accomplish and thereby early secures the safety of the patient.

The operation for the relief of ectopic pregnancy, for the control of its complications and the cure of its sequelae, may be an emergency operation, may be one giving us time for ample preparation of the patient. In a general way it can be said that an ectopic gestation is a malignant growth, and the longer it is unmolested, the greater are the dangers to the mother.

In cases of tubal rupture, and also in cases of tubal abortion associated with symptoms of abdominal hemorrhage, operative relief must be immediately instituted. A patient can bleed to death into the peritoneal cavity without a drop of blood appearing externally. Peritoneal flooding calls for immediate intervention. Operation is equally indicated previous to tubal abortion or tubal rupture, but under these conditions if the patient be vigilantly watched, a delay of two or three days is not very significant.

In all operations for ectopic pregnancy we discard the vaginal route. We prefer the abdominal route. We are justified in making our diagnoses and basing our management of cases upon presumptive evidence. A large mortality results from delayed diagnoses.

The most immediate danger of tubal abortion or tubal rupture is hemorrhage. Laparotomy permits an immediate and complete arrest of hemorrhage. Laparotomy not only secures absolute hemosasis but enables one to

eliminate the danger of post-operative or secondary hemorrhage. It permits a more complete removal of the ovular debris and extravasated blood. It is not necessary to remove all blood from the peritoneal cavity. Let there be no needless traumatizing. Furthermore, laparotomy allows inspection of the pelvic organs and enables one to decide at once whether or not the opposite tube should be removed.

Unilateral tubal pregnancy calls for removal of the pregnant tube. The operator must not be haunted by the thought of recurrence. Recurrence in the opposite tube is exceptional.

We are not justified in sterilizing a woman just because she has had a tubal gestation.

Remove the unaffected tube:

a. If there be existing in the patient some constitutional state contra-indicating pregnancy such as epilepsy, alcoholism, worst types of neurasthenia, syphilis, mental disease, imbecility, advanced tuberculosis, advanced cardiac, renal, or hepatic disease, bad types of primary anemia.

b. If there be existing in the patient some pelvic deformity preventing delivery through the maternal passages of a viable fetus.

c. If it be imbedded in adhesions, if it be malformed or the seat of a congenital anomaly or of inflammatory, neoplastic or other degenerative changes; hydrosalpinx, pyosalpinx, etc.

In unilateral tubal pregnancy and in bilateral tubal pregnancy there should be no needless removal of tissues or organs. Therefore, if the ovaries are normal or only slightly altered, their preservation will be of great benefit to the patient. In addition to removing pregnant tube, fetus and ovular debris, correct co-existing pathological states if the patient's condition permits.

The mortality of bilateral tubal pregnancy, skillfully operated on, is very low. It should be nil. In our collected cases there were only three deaths; two from peritonitis and ileus and one from peritoneal hemorrhage.

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THE ABNORMAL CHILD.

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There is nothing that saddens the life of parents more than the birth of an abnormal child. The hardship of caring for a defective child, the usually hopeless outlook for recovery, and the fear for a possible repetition of the same affliction in the other children tend to make the life of the unfortunate parents a burden and a despair. Considering the subtle, mysterious and complex processes through which the future child has got to go through in its embryonic and fetal development, the number of physical and mental misfits born into this world are comparatively few. Abnormalities in childhood may be congenital, due to some aberration in the developmental processes, or diseases during intra-uterine life, or it may be acquired as a result of some accident at birth or illness during the early weeks or months of life.

While the etiology and pathology of the physical and mental deformities caused by an accident during birth or by disease in early infancy are well known, the etiologic cause and the pathologic processes in congenital abnormalities are usually obscure and indefinite. The symptoms of backwardness or defective development in childhood may be evident very early in life by a retardation or an entire lack in the power of attention, observation, concentration and memory, or in hearing, talking and walking. Since an early diagnosis is essential for the good of the child and the welfare of the parents, the following few cases will be found of interest in the diagnosis, prognosis and course of certain abnormalities in childhood.

Mongolian Idiocy.

Mongolism or Mongolian idiocy is a congenital disease of childhood. Syphilis, illness of the mother during pregnancy, advanced age of parents, the last child in a long series of children, and the possible hereditary transmission of certain dormant abnormal unit characters have all been considered as etiologic factors. But the real cause of Mongolism is still unknown. Elderly mothers may have normal children and young mothers may give birth to Mongolian imbeciles. The Mongolian may be the first, the second or the last in a short or long series of childbirths. In rare cases he may be one of a twin, the other being perfectly normal, or there may be two Mongolian idiots in a family with a normal child intervening. The chief diagnostic feature in this abnormality is a Caucasian child with a Mongolian face. Physical and mental backwardness is evident in early infancy. The head is usually smaller than normal and flattened from before backward. The anterior fontanelle is late in closing. The nose is broad and flat and the palpebral fissures slant downward and inward. Nystagmus is not unusual. There may be protrusion of the tongue and enlargement of the lingual papillae. Deformities of the chest and congenital heart murmurs are not uncommon. An umbilical or epigastric hernia is not infrequent. The joints are lax, the muscles flabby, and the little fingers are short and incurved. The degree of the mental and physical weakness vary in different cases.

The intelligence in some Mongolian imbeciles is at

CASE 1. Fig. 1.—Mongolian idiot 2 years old.

a very low level while in others there is a fair degree of mental activity. A diagnosis of Mongolian idiocy should never be made on the slanting palpebral fissures alone. There are many children who have fairly marked Mongol eyes but are perfectly normal physically and mentally. In Mongolism there is the Mongolian facies in a child who is deficient mentally and physically. The prognosis is always bad. In the majority of cases, death occurs early in childhood, some live to puberty, while a few may reach adult life, much to their disadvantage. Treatment is unavailing,

Case 2. Fig. 2.—Mongolian idiot 5½ years old.

thyroid medication may cause temporary improvement in some cases. A proper diet and good care will do much good. The following two cases of Mongolism will fairly illustrate the general characteristics of this helpless and hopeless disease.

Case 1, Fig. 1.—A girl two years old, full term, normal labor, breast fed for eighteen months and was never actutely ill. She is the eighth living child and the twelfth in a series of pregnancies. The mother consulted me because the child was unable to talk, walk or even to stand unsupported, was not as bright as other children of the same age. On examination the child presented the appearance of mongolism. She was well nourished, the anterior fontanelle was open, had fourteen teeth, heart and lungs negative, slight epigastric hernia, liver and spleen negative, the little fingers incurved, loose joints and reflexes normal. Weight 20½ pounds. Height 30 inches, head 17 inches, chest 18½ inches, abdomen 17 inches. Urine negative. Von Pirquet and Wassermann tests were negative.

Case 2, Fig. 2.—A boy five and a half years old. The sixth child of healthy parents, first cousins. The other children are alive and well. Was of full term, normal labor and breast fed. Had pneumonia at six months and diphtheria at eighteen months. At this age, five and a half years, he is still unable to walk, stand or even sit unsupported for any length of time. The intelligence is of a very low grade, does not take much interest in his surroundings or playthings and cannot express his desires understandingly. The face is typically Mongolian and the expression idiotic. Nutrition is fair, the head is small and flattened, the anterior fontanelle is closed, the tongue is protruding, its papillae are enlarged, and the teeth are normal. Heart, lungs and abdomen negative. The little fingers are incurved. The joints are markedly laxed and the reflexes normal. Height 33 inches, head 19½ inches, chest 20½ inches, abdomen 19 inches. The urine, the Von Pirquet and the Wassermann test were negative. Three other cases of Mongolian imbecility were lately under my care. A girl eight years old, the eleventh child in a family of twelve children, the ten preceding and the one following were alive and well. She was physically fairly well developed but her mentality was very poor. A boy of eighteen months, the eighth child of healthy parents, all the other children normal, was physically and mentally much below normal. A boy of sixteen months, the second child of young, healthy parents, his mentality was very low, had nystagmus, a deformed chest, congenital heart murmurs and a large liver and spleen. In all these three cases the Wassermann test was negative.

Amaurotic Family Idiocy.

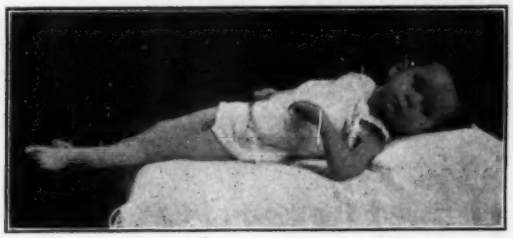
This is a disease of early childhood, characterized by a gradual physical and mental decay, blindness and death. It usually affects healthy children during the end of the first year and for some obscure reason it attacks almost exclusively Jewish children. The disease is familial in the majority of cases, though one child in a family may be affected, the others being perfectly normal. The etiology of this fatal disease is unknown, while the pathology is fairly clear and definite. It is a disease of the central nervous system consisting of a degeneration and disintegration of the nerve cells of the brain and spinal cord.

The symptomatology of amaurotic family idiocy or Tay Sachs' disease is that of a gradual physical and mental retrogression. An infant healthy at birth, and of apparently normal physical and mental development, without any known reason, begins at about the age of eight or ten months to go backward in its developmental progress. The child gradually loses the power to hold up the head, sit up, or carry out properly any other motor function. The face assumes a characteristic expression which is dull, vacant and idiotic. As a result of optic atrophy and degeneration of the retinal ganglia, the power of vision is gradually lost and the thick macula lutea assumes a whitish tinge, while the thin fovea centralis which is embedded in it becomes cherry red, due to a greater transparency of the choridal blood vessels. Hearing, as a rule, becomes hyperacute. As the disease progresses, the extremities become spastic, there is an increase in the reflexes and frequent attacks of convulsions.

The diagnosis is comparatively easy. The history as given by the mother is always suggestive. A healthy infant, breast or bottle fed, and thriving both physically and mentally begins at the later part of the first year to show decadence in body and mind. The child becomes oblivious to its surroundings, the face is dull and indifferent, as is shown in Fig. 3, and there is a diminution in muscle power. In the beginning of the illness the child may be well nourished but later it wastes to a mere skeleton. General physical examination may be negative. Nystagmus and strabismus are not infrequent and hyperacusis is always marked. An ophthalmoscopic examination of the eyes is essential to a proper diagnosis. In every case of amaurotic family idiocy there is seen a cherry red spot surrounded by a grayish white halo in the region of the fovea centralis and macula lutea. This retinal red spot on a whitish background is so pathognomonic of this disease that its presence makes the diagnosis positive while its absence is strong evidence against such a diagnosis. Failure of vision leading to total blindness is a constant symptom. Later in the course of the disease there is a general spasticity, increase in the reflexes, general convulsions and local spasms, extreme emaciation and finally death. The striking diagnostic features of this helpless and hopeless disease are the age of the patient, the gradual decline in body and in mind, the facial expression of idiocy, the hyperacusis, the blindness and the retinal dark-red circular spot on a whitish field. The following case of amauro-

Case 3. Fig. 3.—Amaurotic family idiot at 18 months of age.

tic family idiocy shows some interesting points in the diagnosis and course of the disease.



Case 3. Fig. 4.—Same child as Fig. 3, at 23 months of age.

Case 3, Figs. 3 and 4.—A female infant, the seventh child of healthy parents, Russian Hebrews, first cousins. No history of syphilis, tuberculosis, alchoholism or any other chronic disease. No taint of psychosis in either family. The child was born at full term, normal birth and was breast fed. When the baby was only a few weeks old the mother noticed that it was hypersensitive to sounds. Between the fourth and the seventh month of age the baby had frequent twitching of the upper eyelids, otherwise it was normal in every way. At the age of eight months the mother noticed that the child was unable to raise the head and did not make any effort to sit up. There was an entire change in the disposition of the child, it was dull, listless and paid little or no attention to familiar people and objects.

At the age of ten months the child came under my observation. The history of apparently perfect physical and mental development up to eight months of age followed by a gradual weakness of the body and mind, at once suggested the diagnosis of amaurotic family idiocy. General physical examination was, at that time, negative. Anterior fontanelle was open, posterior closed, cranial sutures closed. There was no nystagmus or strabismus and the child could see fairly well. The facial expression was stupid and indifferent. There was neither spasticity nor flaccidity and the reflexes were normal. An ophthalmoscopic examination revealed the typical cherry red spot surrounded by a whitish zone on each retina in the area of the fovea centralis and macula lutea. Hyperacusis was marked. Urine negative. The Von Pirquet test and the blood Wassermann test were negative. Between the tenth and the eighteenth month of age there was a gradual decline in motor function. The infant was unable to hold up the head or sit up unsupported. The face became idiotic, vision was almost gone and the hyperacusis increased. There was a slight general spasticity and an increase in the reflexes. The child however gained in weight and was well nourished as is shown in Fig. 3. The period between the eighteenth and the twenty-third month of age was marked by a rapid loss in weight and strength.

On examination at this time, the anterior fontanelle was larger than at ten months of age, the posterior fontanelle opened and the cranial sutures separated due to an accumulation of fluid in the cranial cavity. There was total blindness, the facial expression was idiotic and the jaws were kept almost locked. General spasticity and opisthotonus were marked and the reflexes were exaggerated. The child had frequent attacks of tonic and clonic convulsions and occasional facial spasms. The arms and legs were extended, the hands flexed and contracted and the feet markedly extended as is shown in Fig. 4. The little patient succumbed at twenty-five months of age. This was the second case of amaurotic family idiocy in the same family. Two months before this child was born, a girl, twenty-one months of age, died of the same disease. Both of these cases I have reported in the *New York Medical Journal*, November 10, 1917.

Microcephalic Idiocy.

This condition is marked by a well-developed body with a small head inclosing a still smaller brain. There is not only a deficiency in brain substance but there are usually areas of degeneration, sclerosis, cysts and maldevelopment of various fissures and convolutions. In the majority of cases it is a congenital anomaly due to some process which inhibits the cerebral hemispheres from attaining normal growth or to some disease of the brain during intra-uterine life. Diseases of the brain or a meningeal hemorrhage in early infancy may stunt a normally developed brain and prevent it from further normal growth. While in most cases of microcephaly the smallness of the head is due to a small brain, in some cases it is possible that a premature ossification of the cranial sutures interferes with the proper expansion of the skull and the growth of the brain.

The symptoms vary according to the pathologic conditions of the brain. A slightly smaller head than usual is not incompatible with proper physical and mental growth. But a real microcephalic is usually stunted in body and mind. There may be a general muscular flaccidity and the child is unable to raise the head properly, sit up or walk. Much more frequently there is marked muscular rigidity with evidence of a monoplegia, hemiplegia or diplegia. The mentality may be of a very low grade. There may be a reduction in the power of attention, concentration, memory and reasoning or complete idiocy. The prognosis is very gloomy. There is no treatment of any value. The following case is a fair illustration of this disease.

Case 4, Fig. 5.—A three-year old girl, the second of three children, the first and the third being perfectly normal. Parents are young and healthy. No history of syphilis or psychosis in either family. The child was born at full term and the labor was normal. Was never acutely ill. No history of illness in the mother during pregnancy nor any injury to the unborn. At this age of three years, the child is unable to stand, walk or talk. Their is a constant automatic movement of every part of the body so that the child is continuously restless. Vision and hearing seem to be normal. General physicial examination is negative, the muscles are rather flaccid and there is a fairly large body, a broad face with a small head as is shown in Fig. 5. Intelligence is very low, the child looks idiotic. Weight 18 pounds and 4 ounces. Height 30 inches, head 14½ inches, chest 19 inches, abdomen 17 inches. The cause of the defective brain development in this child is probably due to some embryologic error in the processes of growth and formation. Two other microcephalics under my care are equally mysterious in their etiology. A girl of five months, the eighth child of healthy parents, the other children are normal. This baby is unable to hold up the head, has frequent attacks of convulsions and is probably unable to see. A boy of twenty-two months, one of a twin, the other being perfectly normal. The circumference of the head is only 17 inches, cannot walk well and is backward in many other ways.

Case 4. Fig. 5.—Microcephalic idiot, 3 years old.

Cretinoid Idiocy.

Cretinism, cretinoid idiocy or infantile myxedema is a disease of early childhood, characterized by a stunted development of the body and mind. The cause is congenital in many cases, probably due to an abnormal thyroid secretion in the parents or to a subthyroid activity in the mother during pregnancy. Thyroiditis as a complication in infectious diseases may occur in infancy or early childhood and destroy the functional

activity of the thyroid, giving rise to cretinism. The most striking pathologic changes are in the thyroid itself. It may be absent, goitrous or atrophied. The body is much undersized. There is a broad head, a short thick neck resting on a plump body and short chubby extremities. The symptoms are those of physical and mental retardation. The new born are usually of normal weight and length and apparently normal in every other way. At about the age of one year in the infantile type, and three or four years in the juvenile type, it is noticed that these children are too short for their age, they are slow, dull, awkward and apathetic. The intelligence is low and passive, there is a vacant expression, an aimless look, and a meaningless smile. The mentality may vary from slight imbecility to total idiocy.

The diagnosis is easy in a typical case of cretinism. The short stature, the sallow complexion, the coarse hair, the late closure of the fontanelle, the protruding tongue, the thick lips, the large abdomen with an umbilical hernia, the short stubby extremities and fingers, and the laziness of body and mind, all make up a picture of this disease which is difficult to mistake. The mild cases are frequently not diagnosed. They are usually backward in physical and mental development, and suffer from constipation. A careful observation of these mild atypical cretins will point to a proper diagnosis. The prognosis is fair when thyroid treatment is begun early in life and persisted in. Without treatment, the cretin is sure to drift to a state of useless vegetative existence. Even under proper treatment with a good thyroid extract, few, if any, attain real normal physical and mental dexterity. The following case of cretinism may be of interest.

Case 5. Fig. 6.—Cretin, 4 years and 4 months old.

Case 5, Fig. 6.—A. K. is four years and four months of age, the first child to young and healthy parents. No consanguinity, alcoholism, syphilis or any chronic ailment in the parents. The boy was born at full term and the delivery was instrumental. Breast fed for sixteen months. He was never acutely ill but had a rather persistent facial eczema during early childhood. The first tooth appeared at one year, walked at two years, and talked very little. Nothing wrong was suspected till he was three years old when the parents realized that he was too small for his age, did not talk as well as other children of the same age, and was not as bright as his playmates, though he was not a stupid child.

On examination the child looked cretinoid, the face was thick and sallow, teeth poor, heart and lungs negative, marked umbilical hernia, and looked very small as is shown in Fig. 6. Weight 36¾ pounds, height 34½ inches, 17½ inches from crown to naval and 17 inches from naval to soles of feet, head 20½ inches, chest 21 inches, abdomen 21 inches. The mentality though subnormal was not very low, probably due to the fact that he has been under thyroid treatment for some time. Achondroplasia was excluded in this case by the general cretinoid appearance, by the extremities, though short, are too long for achondroplasia in which condition the disproportion between the long body and the short extremities is very marked. In achondroplasia, when walking, the body seems almost to touch the ground. The intelligence is not affected in achondroplasia. Two other cases of cretinism at present under my care. A girl eleven years old, the fourth child in a family of six, the other children are all well. When she came under observation two years ago she was markedly backward in body and mind. She is slowly progressing under thyroid treatment. A boy two years old, the third and the youngest child, shows considerable backwardness in development. Held up the head at one year, sat up at eighteen months, and now at the age of two years he cannot stand, walk or talk. Nutrition is good, eats well but is very constipated. The child does not show the typical symptoms and signs of cretinism, but on examination it is evident that the little patient suffers from hypothyroidism.

Mental deficiency, imbecility and idiocy in childhood differ from the same conditions in the adult. In the abnormal child the various degrees of mental impairment are present in a brain which has never been fully developed. While in the adult, idiocy is the result of a destruction of the already fully developed mental faculties. The abnormal child may be defective mainly physically or mentally or there may be a combined degeneration of body and mind. Physical defects with little or no morbid mental processes are seen in infantilism, dwarfism, and in achondroplasia. In certain cases the trouble seems to be only mental, the child being perfectly normal physically. A boy four years old came under my care because of a disordered mind. He was the youngest child and the only boy in a family of five children. All the others were well. His general appearance and physical examination indicated perfect health, but he was irrational, constantly restless, roaming around the room and breaking everything he could lay his hands on. Hearing was good, but his field of thought and expression were narrow. In an effort to find some etiologic basis for this insane child, I have elicited the following history which may have some bearing on this condition. Some time before the mother became pregnant with this child, the father failed in business, and to sooth his nerves and to drown his sorrows he found consolation in excessive drinking of whisky. He drank for a long while and was seldom free from its effect. The result was that this unfortunate child came to this world through a father whose body and mind were saturated with alcohol. A Wassermann test of the child's blood was negative. In the majority of cases of abnormal children both the body and mind are affected. Cretinism, Mongolism, hydrocephaly, microcephaly, amaurotic family idiocy and the various other organic diseases of the brain cause a deterioration of the physical and mental life.

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FAULTY METABOLISM OF FOOD ELEMENTS DUE TO DEFICIENT VITAMIN.*

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Faulty Metabolism.—Many children are brought to the physician showing marked pallor of the skin, their muscles are flabby, and they perspire easily. Examination of the blood shows a secondary anemia. There is imperfect metabolism of the fat, protein, and carbohydrate elements of the food. The stool frequently contains mucus, and shows an undigested condition. The weight remains stationary, or there is but

*Contributed to *The Therapeutic Gazette*, and THE MEDICAL TIMES.

slight gain during many weeks. These infants show symptoms of a disordered nervous system; they are peevish and dissatisfied by day, and restless at night. Something is lacking, and this something must be supplied or a "deficiency disease" develops. Such condition is usually manifested by a structural weakness in which bony and muscular defect is found.

Scientists have for years claimed that scurvy was caused by abstaining from fresh vegetables, or from a too generous use of boiled or canned foods. The absence of a live factor was known theoretically. It remained for Funk and his collaborators to demonstrate experimentally that beri beri could be produced by feeding polished rice, and could be cured by feeding unpolished rice. They further demonstrated the presence of a crystalline substance which could be isolated, and to which the name of "vitamin" was given. This vitamin when absent from food is responsible for the development of scurvy. Funk further found that when the vitamin necessary for the proper metabolism of food, and especially of carbohydrates, was absent there results therefrom a condition described by him as a "deficiency disease."

Vitamin can be supplied to the body by giving autolyzed yeast. This has been the subject of clinical and experimental study, and was published in *American Medicine*, November, 1916, by Stark and Edelman.

To determine whether or no the active substance was a complicated product of a protein or phosphatide nature Funk subjected yeast to the hydrolyzing action of 20 per cent. sulphuric acid for twenty-four hours. It is known that this concentration of acid acting for the above mentioned length of time hydrolyzes all the ascertained existing complex products, as, for instance, proteins, polysaccharids, nucleic acids and lipoids. The work done by Funk in conjunction with Cooper (Cooper and Casimir Funk, *The Lancet*, May 4th, 1911) showed that yeast treated in this way possesses very nearly the full action of the original yeast. At the same time this gave a hint as to future procedure and led to the introduction of autolyzed yeast as a curative agent by Cooper (*Biochemical Journal*, June, 1914).

My personal experience with autolyzed yeast in liquid form and with vitaphos (General Drug Co.) in dry form dates back to one year. My results were published in the *Medical Record* for July 7, 1917.

The following series of cases will show the types of cases selected wherein deficiency disease of one or another form existed.

India H. was seen by me in consultation with Dr. Wrenn at the Ossining Hospital, in March, 1917. The infant was asphyxiated at birth, cyanotic, and resuscitated with the aid of a pulmotor after fifteen minutes. Forceps delivery, external traumatism, slight facial palsy. Weight, 5½ pounds at birth. No food was taken during the first four days, later food was refused.

When first seen the infant was emaciated and there was marked icterus neonatorum. Temperature, 98.6 by rectum; respiration 24, pulse 72. To sustain strength gavage was ordered. There was marked dullness on the right side, lower lobe, and rigidity of the extremities. The stomach was lavaged with bicarbonate of soda, one dram to a pint of warm water, and the infant fed by gavage every three hours, one-half dram of condensed milk in two ounces of water, gradually increased to one dram in three ounces of water. One drop of adrenalin was given morning and evening. Colonic injections of saline solution were given at a temperature of 105 two times a day. Convulsions were present. Intracranial pressure was relieved by means of lumbar puncture and 10 c.c. of slightly opalescent spinal fluid withdrawn. The infant relaxed and convulsions ceased. The appetite improved, and the infant gained in weight about 4 to 6 ounces a week. This rate of gain continued during the summer. During the first two months skimmed milk and peptogenic milk powder were given. The feeding was then changed to whole milk, granum and dextri-maltose and water. In conjunction with this restorative diet, one grain of vitaphos was given three times a day. Spinach juice was given for its antiscorbutic effect. The dose of vitaphos was increased until 2½ grains were given three times a day.

Liza S., born Dec. 24, 1916, at the Lutheran Hospital, weighed 4 pounds at birth. First baby—full term. Was breast fed about four weeks, later fed on milk and barley water, still later granum was given.

When seen by me the infant had marked signs of rickets, beaded ribs, asthmatic wheezing, seborrhoea caput, a tendency to constipation, head sweating, and a bulging fontanel. The tongue protruded, and there was marked backwardness in development. A restorative diet consisting of cereals, vegetable and fruit juices was given. The weight increased, and a general improvement was noted. Owing to the low weight at birth it was thought advisable to aid the assimilation of food by supplying vitamin in the form of autolyzed yeast. Endomycin was accordingly given in doses of 10 drops three times a day. This dose was gradually increased until the infant received 50 drops three times a day.

Owing to the rachitic condition the intestinal and other internal secretions were very sluggish, and accordingly laxatives were frequently administered. In the beginning of treatment, one grain vitaphos powders were given twice a day, later three times a day. This was continued for two months. As the infant's development increased a larger dose was given, until at six months of age 2½ grains were given three times a day. In addition to stimulating the internal secretions, it had a mild laxative effect. After several weeks of treatment a better tone was noted and the general nutrition was improved. Cod liver oil in 5 to 10 drop doses distressed the stomach causing eructations and very loose stools. Vegetable juices acted as an excellent restorative. Spinach juice, and later spinach pulp, was given at six months of age, also mashed carrots and baked potato. Orange juice was given for thirst. One month after this diet was begun the profuse head sweating ceased, the hard and dry scybalous stools improved and the vomiting gradually ceased. This treatment was continued above five months.

Eleanor L., born Oct. 24, 1916, was seen by me when five months old. She then weighed 9 pounds and 10 ounces. She had had colitis, jelly-like and long mucus shreds in the stool, and evidences of intestinal catarrh such as excoriation at the anus, a slight prolapse of the rectum, and the appearance of general emaciation due to malnutrition. The muscles were soft and flabby, and the infant was not thriving. Skimmed milk was given, later maltose was added. Six teaspoonfuls of spinach juice, gradually increased to 12 teaspoonfuls, was given daily. After one week spinach pulp was given, and whole milk was substituted for the skimmed milk. Baked potato and spinach pulp were alternated daily. Vitamin was supplied by giving 2 grains of vitaphos three times a day. This was continued for one month. The colitis improved after one week's treatment. The infant gained steadily both in appearance and weight. In June, two months after treatment was begun, the weight was fourteen pounds. Two teeth appeared at

the age of seven and one-half months, and there has been a general improvement in growth since that time. The vitaphos was gradually increased until, during the third month, 5 grains were given three times a day. It was then discontinued.

Sylvia G. was referred to me by Dr. Harry Goldman with the following history: Forceps case with convulsions soon after birth. Breast fed eleven months, and weighed at the age of thirteen months 17 pounds. Has always suffered with torpid internal secretions, always had dry scybalous stools. Cannot stand nor talk, and shows no evidence of intelligence. Is backward in both mental and physical development.

Lumbar puncture was performed, and the cerebrospinal fluid examined by Dr. Frederick E. Sondern. His report follows: The specimen consists of approximately 15 c.c. clear fluid without coagulum, but containing a few small, fine greyish specks believed to be debris. The cell count is within the normal limits, being 3 per cu. mm. The cysto-count shows the usual mononuclear cells of the cerebrospinal fluid. The globulins are not increased. No organisms of any type can be found.

Because of the peculiar backwardness the possibility of a tumor in the cella turcica, an *x*-ray was taken. This proved negative, but a thickened condition of the cranial bones was noted. The report of Dr. Wm. H. Stewart follows. Stereoroentgenographic examination of the head of Sylvia G., Jan. 17, 1916, revealed a distinct abnormal thickening of the cranial bones; particularly is this noted in the vertical plate of the frontal bone and in the posterior portion of the orbital and the orcipital.

Upon examination of the roentgenograms it can be readily appreciated how a definite interference with the normal expansion is present. It is this, I think, which gives the peculiar form to the child's head.

The ophthalmoscopic examination showed a pallor of both optic nerves, the fundi otherwise normal.

Lecithin was ordered, one dram of the Fairchild's solution given three times a day. This was continued for over two months with no apparent improvement. One grain of thyroid extract with one-half grain of the pituitary extract was given for the following three months with decided advantage. The stool became more regular and the scybalous character gradually lessened. The general condition, such as circulation, intelligence, and strength, improved. At this time the diet consisted of vegetable puree such as baked potato, spinach, peas and carrots. The yolk of hard cooked egg was given for its fat and lecithin content, and was well assimilated. Dentition long delayed made rapid progress, likewise the child, then at the age of three years, commenced to speak and also to walk. Vitaphos had been given in 2½ grain doses three times a day with exceedingly good result. But my greatest reliance in this case has been on the persistent use of the internal secretions and the diet. The child has been a source of considerable anxiety, as the prognosis was hopeless from the beginning, and various opinions given, all agreed that nothing could be done.

Frances G., born Nov. 27, 1916, was three months old when seen by me. Weighed 5 pounds at birth, 7¾ pounds when three months old. Was premature five weeks. Had had alternate feedings of breast milk and Nestle's food. The infant was restless, had head sweating, and greenish stools containing mucus and occasionally yellowish-white casein particles. The circulation was stagnant, arms, legs and face markedly oedematous. The urine contained albumen and traces of sugar. Nestle's food was discontinued and in its place skimmed milk 2 ounces, maltose one dram, and water 3 ounces was given, alternating with the breast. This substitute feeding improved the stools, and satisfied the infant but did not increase the weight. Autolyzed yeast (endomycin) was ordered, 10 drops three times a day, and 5 drops more each day until 50 drops were given three times a day. This was continued, in all, about five weeks. The infant appeared brighter and gained in weight. The food was increased ½ ounce more every two weeks until 4 ounces of skimmed milk, 2 ounces of water and 1½ drams of maltose were given. At six months the infant was weaned, and whole milk substituted for skimmed milk in the formula. The faulty metabolism of both fat and protein seemed to improve after two weeks of the autolyzed yeast treatment, likewise the gain in weight was steady, the stools became more homogenous, and contained less mucus and fewer curds.

Summary and Conclusions.—When we feed food deficient in vitamin, be that the human breast or cows' milk, such feeding will result in structural deficiency which may remain throughout life. The earliest manifestations and symptoms to watch for are profuse sweating, restlessness, irritability, wakefulness night and day, stationary weight or slow gain and constipation with hard, dry scybalous stools showing imperfect digestion. In these stools fat curds and casein lumps can frequently be seen. It is this class of cases, if seen early and the symptoms carefully noted, will rapidly improve under the influence of restoratives such as the vegetable juices; especially those containing iron like spinach, lettuce, salad Romaine and Swiss chard, also small doses of cod liver oil, but it must be the pure oil undiluted, 3 to 5 drops morning and evening, gradually increased. Autolyzed yeast in liquid form, or vitaphos in tablet or powder form in an excellent restorative. Milk to which is added the crushed yolk of hard-cooked egg, or milk to which several teaspoonfuls of baked potato is added can be given with advantage to correct the above named symptoms. Orange juice should be given as early as the second month if the above named symptoms appear. When these symptoms are neglected then such deficiency disease as rickets and scurvy in a susceptible body usually results.

155 West 85th Street.

Medical Inspection in Schools of Great Britain.

E. L. Roberts reviews the development and scope of medical inspection of school children in Great Britain.

Medical inspection of school children is now compulsory, and is nominally in charge of the Board of Education, but the actual work and immediate supervision are conducted by medical officers, inspectors of physical training, school nurses, physicians and dentists. Every child is thoroughly examined and defective children are segregated from the rest and educated apart from the normal children. Special attention is also given to the blind, deaf, crippled and incorrigible children. Eye and ear defects are noted and remedial measures recommended. Specialists are employed on a part time basis for the treatment of eye, ear, nose, throat and skin diseases. Many dentists are employed both for inspection work and for treatment. Special attention is given to the feeding of necessitous children, as well as other children who desire a warm and wholesome midday lunch on the school premises at a minimum cost. Part of the work is the inspection of schools, and recommendations for improving old structures and for designing new ones.

Roberts reports on the condition of the ventilating system, the nature of the desks and benches used by the children. Inquiry is also made into the effectiveness of the lessons on personal hygiene that are taught in the schools.—(*Bull. Bureau Education*, No. 49.)

MEDICAL JURISPRUDENCE, OUR SOCIETY AND THE WORLD WAR.*

OSCAR W. EHRHORN, M. A., LL. B.,
PRESIDENT OF THE SOCIETY OF MEDICAL JURISPRUDENCE; PAST PRESIDENT AMERICAN ASSOCIATION OF MEDICAL JURISPRUDENCE.
New York.

As was stated by me in a former paper, medical jurisprudence may be said to embrace all those questions which bring medical science to bear on legal questions in determining civil and criminal responsibility and to include therefore questions affecting civil and social rights of individuals, and practically treats of the relation of the individual from a period prior to his birth to one subsequent to his death. When we consider that within its province are the subjects of pregnancy, birth, monstrosity, rape, accidental or intentional injuries, the action of drugs, insanity, malingering, natural death, murder, etc., this becomes immediately apparent. While therefore we note that the subject has to deal with the legal medical and chemical professions on the one hand, on the other hand it has to deal with all the various individual and group relationships of our complex civilization.

With the coming of the great war and the assumption of war powers by the President and his various representatives and the departments of the Government a new set of questions have arisen, old ones have been settled without argument and many of the new ones require discussion and settlement.

This society, by reason of the number of its officers and members who have been and are engaged in war service at home and abroad, has to some extent lost the benefit of their activities, but on the other hand it has qualified them as experts on various subjects by reason of which this society and the community will obtain the benefit of their service when they are released by the Government.

Malingering.

A number of topics which in peace times occupied but a comparatively small part of the time and attention of medical jurists, now have become most important, among which is the subject of malingering. Diseases are often so successfully feigned that the most skilled of medical men are baffled. In peace times the courts have to deal with the subject principally in attempts to magnify the result of injuries in so-called accident cases, or in murder trials and in other criminal actions in attempts of the defendant to appear insane. To be able to demonstrate the falsity of the pretended condition is very difficult in many cases for as against the apparently truthful statement of the one malingering is merely opposed the opinion of the so-called expert. The judge or jury are concerned with the question as to whether or not the condition alleged to be present resulted from the injury said to have been sustained and whether or not the person really was suffering from the alleged affection. In peace times the number of these cases, comparatively speaking, is relatively small, although the passage of the Workmen's Compensation Law has probably tended to increase the same, but when one in ten of our population, inclusive of men, women and children, are called upon to show cause why they should not render military service to the Government, it becomes apparent that the number of those seeking to magnify their deficiencies or falsely represent their physical condition is multiplied.

However, the attention of our scientific men has been called to this matter, and numerous mechanical and other devices have been originated so that the malingerer finds the task before him no easy one. The advances which have been made along these lines by reason of the increased impetus on account of the war may well be brought before this society, and we hope in the future, at no distant date, to bring this matter up for discussion.

Centralization of Governmental Power.

An examination of the course pursued by the Supreme Court of the United States in recent years consistently shows that more and more that court has been recognizing powers in the Federal Government which in former times were at least understood to be reserved to the States. Acts of Congress designed to accomplish police regulations have been upheld upon either the taxing power or the interstate commerce provisions of the Constitution, notwithstanding that by common consent it was acknowledged that the real object was police regulation. Examples of this may be found in the Sulphur Match Legislation, the Webb-Kenyon Liquor Tax decision, the Mann so-called White Slave Law, and others. With the coming of the war an unprecedented exercise of war power has resulted in the President and the Government laying down regulations which in time of peace would, of course, clearly be in violation of the law. Under these circumstances the medical and legal professions should address themselves to the subjects comprehended by the various orders of the departments to the end that the purposes designed to be accomplished may be efficiently carried out and that where the same are ill-advised that the Government may receive the benefit of the discussions of those best qualified to advise it.

The Society's Resources and Opportunities.

Our society at the present time has, through the wise and conservative action of its board of trustees in former years, gathered together an amount which now is almost of a sufficient size to warrant its income being used for the purposes of the society. While the principal should not be affected, nevertheless the income should be used in assuring a proper publicity to the papers of scientific value and provide a fund for investigation along some of the important lines of thought which have proved the subject of our papers in the past. All societies of whatever character, in war times, however, lose membership and consequently income. This society should therefore address itself actively to the question of increasing its membership so that not alone will the income be maintained but that its income may be increased and multiplied. The privileges and advantages which come with membership are so many and important that the nominal membership fee is negligible.

Social Evil.

With the gathering together of thousands of men in camps and cantonments far from their homes and deprived of many of those associations to which they have been accustomed the social and sexual life and temptations of the men become questions of increased interest and importance.

Whether attempted extermination, repression or license and regulation be the better plan has been a mooted question, but certain it is that the welfare of the army depends in large part on the successful handling of the problem. When it is considered the large portion of every population that resorts in greater or lesser degree to the women of the half world in peace times, the importance of the question in war times can scarcely be exaggerated. What the Government and those primarily interested in the matter are doing will be brought

*Inaugural address. Read at Society of Medical Jurisprudence, January 14, 1918.

before you later in the year for your consideration and attention.

Free Speech.

"Lese Majeste" in former years we heard a great deal of because it was so entirely contrary to our ideas of free speech and the rights of newspapers and individuals. With the coming of the war, the necessary limitations put on our own people has seemingly been applying to our Government officials an immunity from criticism and invective which a few months ago was quite commonly indulged in. What these limitations are or should be may properly be discussed by this society, for one court tolerates even yet what others reprobate. And so-called "martyrs to Free Speech" are not few. Are they who persist in their course more or less mentally unbalanced or are they the Vestal Virgins of the 20th Century?

Conscription.

The change in the public sentiment with respect to conscription of men for military service apparently is so great that those advocating conscription of wealth are not considered as radical as they would have been a few years ago. Government control of railways and products leads us to consider the probability of government control of professional services and whether regulation of prices, wholesale and retail, may not portend regulation of professional fees. The call of President Wilson to the medical and legal professions in his messages with reference to the present draft, that all such professional men should regard it as a high privilege to render free of all cost their best and continuous services to the end that no one should be put to the necessity of paying for such service, is probably but a forerunner to other calls for voluntary and probably involuntary service. While these will be rendered by our professions willingly and unselfishly, yet the question must suggest itself as to how far these may be carried when the war necessity may no longer be present.

Will our fight for democracy lead us to a social democracy or shall we, when the sword shall have been beaten into the ploughshare again return to the age of the individual, the age of competition, the age of reasonable *lausse faire,* or shall we retain much of government control and socialized concentration and community effort? In the field of medical jurisprudence there is much to study and determine, and this Society may do a useful part in its chosen field.

Proposed National Prohibition Amendment to the Constitution.

One of the most important and far reaching pieces of legislation proposed is that of an amendment to the Federal Constitution prohibiting generally the sale and manufacture of all alcoholic beverages. This amendment has been approved for submission to the States by a vote of the Senate and the House of Representatives. In the judgment of the reader, this legislation is entirely opposed to the theory upon which our Government was founded. Prohibition advocates have up to this year urged its necessity purely upon the ground that States which had passed prohibition legislation were unable to obtain favorable results by reason of the fact that they adjoined other States which were not prohibition States and which so conducted their affairs that whatever benefits (?) arose from prohibitory legislation in the prohibiton States were neutralized by the propinquity of the "wet" State. In the main these advocates have heretofore freely admitted that they were asking for something which on the theory of the United States system of government they were not entitled to, save by reason of the extraordinary condition of affairs arising from such system. With the decision on the Webb-Kenyon law heretofore referred to, which prohibit and prevent sending alcoholic beverages, etc., into "dry" States, fortified by the post office rider and Reed amendment, there is no longer any argument available to the prohibitionists save their desire to inflict upon "wet" States a prohibition law, notwithstanding that the citizens of those "wet" States desire to have them continue as they are. It is now possible for a small minority of "dry" enthusiasts carrying the requisite number of States to impose their will upon a majority of the people of the United States scattered throughout the union as well as render "dry" other important States containing the bulk of the wealth, population and intelligence of the nation, who may by their votes reject the same.

In the judgment of the reader of this paper, this legislation is entirely un-American as well as undesirable in the light of the experience of European countries. It will be noted, furthermore, that no compensation is intended to be made so that vast properties and investments will be practically confiscated.

Discussion of this topic by the best brains of the country should accentuate the points that (1st) in its proposed form, the amendment is objectionable as giving concurrent authority in enforcement thereof to the States and the nation with its consequent uncertainty and clash; and (2nd) as being undesirable on its merits either as a permanent amendment or temporarily during the term of the war.

BLOOD CHEMISTRY: ACIDOSIS INDEX.*

AUGUST J. P. PACINI, M. D.,
Brooklyn, N. Y.

Diabetic coma is associated with a well-defined form of acidosis; and it is significant that terminal diabetes is accompanied by increased respirations, increased pulse rate and a lowered tension of carbon dioxide in the blood and in the alveolar air.

Normal protoplasm has a dominantly alkaline reaction. During anabolic and katabolic metabolism, however, acid wastes are formed. In the economy there are two strikingly sensitive mechanisms provided to rid the body of the acid wastes and restore the pristine alkaline reaction to the tissues. The first of the mechanisms is a chemical one and resides in the blood.

There are present in the blood three types of chemical salts collectively known as "buffer" substances. A buffer is any substance which neutralizes the shock of an opposing force. The buffer substances of the blood are alkali compounds and they neutralize the shock of the opposing acid forces formed during metabolism either normally or pathologically in disease. The first buffer substance is alkali—proteinate and is relatively unimportant. The second is alkaline sodium phosphate and the third alkaline sodium carbonate. During the course of metabolism the major acid waste formed is carbon dioxide. It is noteworthy that carbon dioxide is but a very weak acid and further is readily soluble in watery solutions. Carbon dioxide soon dissolves in the blood and renders the reaction of the same slightly less alkaline—or what is chemically equivalent, faintly more acid. This minute change in the reaction of the blood inaugurates into play the second mechanism provided for ridding the body of acid wastes—the physiological mechanism. With the advent of a slight acidic change in the circulating blood, the centers of respiratory and cardiac control are stimulated to greater ac-

*A brief report submitted before the Surgical Clinic of Dr. William Francis Campbell, Trinity Hospital, Nov. 10, 1917.

celeration. Concomitant then with the faintly acidic reaction, the respirations increase thereby facilitating pulmonary ventilation of the blood and aiding quickly to rid the body of volatile acid wastes; and the cardiac rate is increased more rapidly to propel the blood to the lungs for added aeration and to carry to the liver, kidneys and sudorific glands the neutralized acids that have occasioned increased respiratory and cardiac action.

In the course of pathologic phenomena, acids less volatile than carbon dioxide may be formed. Aceto-acetic and beta hydroxybutyric are familiar examples. These are chemically entrapped by the buffer substances sodium phosphate and sodium carbonate. Sodium carbonate being possessed of greater chemical avidity is first chosen to neutralize the invading foreign acids. The chemistry involved is simple. The stronger acid, say, aceto-acetic or beta hydroxybutyric, neutralizes the sodium carbonate by combining with the metal radicle sodium, liberating the less strong acid, carbon dioxide and with the shift in reaction which ensues, the physiological mechanism above outlined is brought into action, and the cycle of ridding the body of acid wastes is repeated as before.

When the quality of the pathologic acid poured into the body is so strong, or the quantity so great as to neutralize all of the available buffer sodium carbonate, the sodium phosphate is attacked. A repetition of events follows, in this case phosphoric acid being formed in the place of carbon dioxide. The phosphoric acid combines with other hematogenous alkalines and is eliminated through the kidneys in the urine.

Delicate is the mechanism, both chemical and physiological, which strives to maintain the normally alkaline reaction of the tissues. And deep and binding is the relation coexisting between respiratory rhythm, pulsatory pace and tissue reaction.

As a measure of the lessened alkalinity of the tissues, many accurate clinical laboratory methods may be employed. The determination of the carbon dioxide conbining power of the serum after the description of Van Slyke is useful. Estimation of the hydrogen iron concentration of the blood by the gas chain method, or the more facile indicator method of Marriott, is recommended. But the method which lends itself clinically by virtue of its combined simplicity of technique and reliability of results, is the determination of the alveolar air tension of carbon dioxide by the indicator method as described by Marriott. This method is adequately outlined in the texts on clinical diagnosis and has been adopted as a routine so universally as to preclude the necessity here for further elaboration of details.

Suffice it to recall that the average normal value by this method for the alveolar air tension of carbon dioxide is given as 30. Figures above 30 are indicative of greater alkalinity. Figures below 30 point to less alkalinity—or more acid.

Assuming the average normal respiratory rate to be about 20 respirations per minute, and the average normal pulse rate to be 80 beats per minute, and the average alveolar tension of carbon dioxide to be 30, the following mathematical grouping is offered as an index of acidosis:

$$\frac{\text{Pulse rate—respirations}}{\text{twice } (CO_2)} = 1.000$$

In words, the pulse rate less the respirations divided by twice the Marriott figure for alveolar air carbon dioxide tension equals unity, in the average normal case. An example—pulse rate 80; respirations 20; CO_2 30.

$$\frac{Pr—R}{2\ CO_2} \quad \frac{80—20}{2\ (30)} \quad \frac{60}{60} = 1.000$$

Without further preamble, some findings in a number of operative cases studied at the Trinity Hospital will be offered:

Case.	Diagnosis.	Pre anesthetic index	Post anesthetic index	Result
1.	Goitre	2.5	3.0	Died
2.	Esophageal stricture	2.6	died during anesthetic	
3.	Gall stones	1.0	0.98	Recovery
4.	Gastric ulcer	1.1	1.0	"
5.	Oophoritis	1.6	1.4	"
6.	Appendicitis	1.1	1.0	"
7.	Hernia	1.65	2.2	Died
8.	Lane Kink	1.02	1.0	Recovery
9.	Carcinoma colon	1.42	1.2	"
10.	Breast amputation	1.1	1.1	"

The determination of the acidosis index has become a routine procedure at the hospital, and in 100 consecutive operative cases it has served to guide whether general anesthetic were indicated or contraindicated.

Determination of the acidosis index before anesthesia gives the surgeon a clear insight to the general metabolic efficiency of the patient. It affords information more positive than the urinary findings, which are ubiquitously ignored, as to the anesthetic risk, it having been empirically determined that an acidosis index of 2.00 or more contraindicates anesthesia. It decides whether violent preoperative purgation, which always increases the acidity of the tissues, hence raises the acidosis index, might not better be dispensed. It points to the folly of complete preoperative starvation, which is a powerful influence for inducing acidosis. In the event the acidosis index is much above normal, say, about 1.5 or 1.75, it argues for preoperative alkaline therapy.

During anesthesia, the pulse rate alone is sufficient to indicate how the acidosis equilibrium is being maintained. A rise in the pulse rate argues for impending danger in that the acidosis index is rising also; and immersing the laparotomy sponges in a solution rendered isotonic with sodium bicarbonate is often effectual in lowering a threatened pulse raise during anesthetic. Should this simple expedient fail, colonic irrigations of bicarbonate solution aid materially; and as an emergent resort, dextrose and bicarbonate infusions must ever be remembered.

Post-operatively, the acidosis index is valuable in gauging the prognostic course of the case. No case speedily recoups from operative measures until the acidosis index is brought to as nearly normal as is possible.

In conclusion may it be recalled that much benefit has accrued to heeding the advice of George W. Crile in his advocacy of the shockless operation. Herein the nervous energy of the patient, is conserved using every means available. But let it be remembered that nervous energy is but one form of a greater bodily potential, chemical energy. Chemical energy is fundamental in bodily existence. Metabolism is an expression of chemical energy. Acidosis is an expression of the status of metabolism. Hence, no surgical measure is complete which fails to ascertain the preoperative acidosis, which fails to guard the operative acidosis, and which ignores the post-operative acidosis. To conserve the chemical energy of the economy is the duty of the surgeon, and the acidosis index is a practical clinical expedient which serves as a valuable guide.

Trinity Hospital.

PERSONAL HISTORY OF APPLICANT FOR APPOINTMENT IN THE MEDICAL RESERVE CORPS, UNITED STATES ARMY.

Give your name *in full* (including your full middle name):.....

The date of your birth:..... The place of your birth:.....

When and where were you naturalized (if of alien birth)?.....

Are you married or single?..... Have you any children; if so, how many?.....

What is your height in inches?..... Your weight, in pounds?.....

Give the nature and dates of all serious sicknesses and injuries which you have suffered:.....

.....

.....

.....

Do you labor under any mental or physical infirmity which could interfere with the efficient discharge by you of the duties of a medical officer?.....

If either parent, or brother, or sister has died, state cause and age in each case:.....

Do you use intoxicating liquors or narcotics; if so, to what extent?.....

Have you found your health or habits to interfere with your success in civil life?.....

What academy, high school, college, or university have you attended? State periods of attendance from year to year, and whether you were graduated, giving date or dates of graduation:.....

.....

.....

Name any other educational advantage you have had, such as private tuition, foreign travel, etc.:.....

.....

Give all literary or scientific degrees you have taken, if any, names of institutions granting them, and dates:

.....

With what ancient or modern languages or branches of science are you acquainted?.....

When did you begin the study of medicine, and under whose direction? His residence?.....

.....

How many courses of lectures have you attended? Names of colleges and dates:.....

.....

When and where were you graduated in medicine?.....

(Fill this out and send it to the Surgeon General, U. S. Army, Washington D. C.)

Have you been before a State Examining Board? If so, state when, where, and with what result: .....

.....

Have you had service in a hospital? If so, state where and in what capacity, giving inclusive dates of each kind of service: .....

What clinical experience have you had in dispensary or private practice? .....

.....

Have you paid particular attention to any specialty in medicine; if so, what branch? .....

What opportunities for instruction or practice in operative surgery have you had? .....

.....

Have you previously been an applicant for entry into the United States service? If so, state when, where, and with what result: .....

Are you a member of the organized militia? If so, state with what organization and in what capacity. .....

.....

Have you been in the military or naval service of the United States? If so, give inclusive dates of service with each organization, designating it: .....

In case of war or threatened war, will you accept active service for duty with the Army, should your services be needed? ....

What occupation, if any, have you followed other than that of student or practitioner? .....

Present or temporary address:† .....

Permanent residence:† .....

I CERTIFY that to the best of my knowledge and belief the above statements are true.

Signature ☞ .....

Date, ..., 191

Subscribed and sworn to before me, this.....day of.....A. D. 191

[SEAL] .....

[Signature and official title.]

†The candidate should give his present address for correspondence, and also his permanent address to which he desires commission sent should he be appointed.

FORM 149
W. D. S. G. O.
(Revised March 6, 1912)

MEDICAL TIMES
July 1, 1917

.....*, M. D.*

OF

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.....*, 191*

FURNISHES PERSONAL HISTORY

IN CONNECTION WITH

APPLICATION FOR APPOINTMENT

IN THE

MEDICAL RESERVE CORPS,
U.S. ARMY

.....*Inclosures*

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NEW YORK, MARCH, 1918.

25,000 Medical Officers.

On February 8, 15,375 medical men were serving as medical officers in the United States army. Of these, 13,401 are members of the Medical Reserve Corps. In addition, 3,370 physicians have accepted commissions, but have not yet been called to active duty. In a word, one out of every seven physicians engaged in active practice in this country is a commissioned medical officer.

The percentage is too low. It should be much higher.

Possibly more men are not necessary at the moment, but when great armies get into the field the Surgeon General will need far more medical officers than are yet in sight. Not less than 25,000 surgeons should be at his command, so that he may feel safe in the thought that he can cope with every emergency.

Some physicians believe their acceptance of a commission means immediate service. It is quite possible for a medical man to receive his commission and continue in the practice of his profession until his services are required. He is given ample time to close up his affairs before going on active duty.

Let us uphold the hands of Surgeon General Gorgas by flocking to the standard.

One of his assistants has said that "our fighting forces would be decimated by sickness and casualties in six months were it not for an efficient army medical corps."

We must remember that in the enemy countries *every* medical man is an officer in the army or navy, whether he wills or not.

In this country let every medical man offer his services, not because an iron government compels it, but because he is sufficiently patriotic to be willing to give his ability, and life, if needs be, to the country which has nurtured him and which gives him shelter, livelihood and life.

Let us make it 25,000!

Psychological Abstractions.

When we love others, and when we feel sympathy for the suffering, are we merely projecting our own egos, and making them the object of affection and solicitude? Is all love fundamentally self-love? Those who are putting forward this seemingly cynical philosophy argue that the capacity to feel sympathy for the suffering rests upon the ability to put one's self in the other fellow's place, so that the solicitude is based upon a figurative transmutation of the ego. This point of view is an outgrowth of the Freudian doctrines. There is a period in the young life of the human being known as the Narcissus cycle, during which the individual is preoccupied only with self, and which is rated as a normal phase of psychic development. Then there comes a time when that preoccupation is transferred to fellow human beings and becomes socialized. But the contention seems to be that it is one's self that one still continues to see in others, or phases of one's self that are imagined and that appear to objective advantage when so viewed in others. The imagination is helped out by concrete situations in the lives of others which the observer, in his subconscious mind, conceives of as vicarious personal experiences. The social as well as personal connotations of these things are obvious.

This line of reasoning is either fallacious, or we are essentially selfish beings.

The most we can say, if there be truth in this philosophy, is that our selfishness can be guided in enlightened channels.

The reader will ask, what are we doing when we hate others? Are we hating ourselves? Are international and racial prejudices only practical expressions of a contempt that we feel in our subconscious minds for some of our own objectionable social and personal traits? If this be true there is a bright side to this new philosophy, for in the proper recognition, discipline and correction of our own vices would be found the key to a cure of our international and racial prejudices. If all men could be brought to see this the millennium would be at hand. If the Teuton could be made to understand that the fear of those whom he considers his enemies is nothing but the guilt that is in himself, translated, he might be induced to cleanse himself. Perhaps his genius for philosophic insight may yet be utilized for his salvation. Start a new philosophy in Germany and you can depend upon its utmost development by that country's industrious intellectuals and research fanatics. To believe that a moral regeneration of Germany is not possible is realiy to believe that our own regeneration is impossible. So long as we are only less unclean than the Germans we cannot come into the court of morals with good grace.

Let us all take a bath.

Attention! About Face!

Medicine may yet have to give thought to its relation to the conditions that will follow the social changes that now seem written upon the wall in all the belligerent countries. When the labor-controlled democracies come into being, and the medical profession is called upon to adjust itself to the new dispensation, and to stop thinking almost wholly in the terms that

characterize the retainers of capitalistic dominion, there will naturally be a turnover in attitude and in practice. First of all, we must begin to contemplate seriously what the new dispensation will be like. In this connection it is well to recall what the seer Emerson prophesied:

God said, I am tired of kings,
I suffer them no more;
Up to my ear the morning brings
The outrage of the poor.

Think ye I made this ball
A field of havoc and war,
Where tyrants great and tyrants small
Might harry the weak and poor?

I will divide my goods;
Call in the wretch and slave:
None shall rule but the humble,
And none but Toil shall have.

I will have never a noble,
No lineage counted great;
Fishers and choppers and ploughmen
Shall constitute a state.

Lo, now! for these poor men
Shall govern the land and sea
And make just laws below the sun,
As planets faithful be.

I break your bonds and masterships,
And I unchain the slave:
Free be his heart and hand henceforth
As wind and wandering wave.

To-day unbind the captive,
So only are ye unbound;
Lift up a people from the dust,
Trump of their rescue, sound!

Pay ransom to the owner
And fill the bag to the brim.
Who is the owner? The slave is owner,
And ever was. Pay him.

My will fulfilled shall be,
For, in daylight or in dark,
My thunderbolt has eyes to see
His way home to the mark.

When Emerson wrote the foregoing lines he was looked upon as a harmless dreamer, a transcendentalist, but in what must have seemed to his contemporaries mere academic anarchism we find formulated the philosophy of the democratic movement now in progress.

Does anyone suppose that under the new dispensation such makeshifts as health insurance will be tolerated for a moment by a free and economically well-ordered people, with a keen recollection of the Prussianistic degradations that the retainers of the privileged classes once sought to foist upon them? What is now sauce for the goose must be made sauce for the gander, too. The profession will be left free, and self-respecting men will share alike in the benefits that medicine has to bestow.

A Lovable Teuton.

We have heard too little of men like Nicolai, doctor of medicine and professor of psychology in the University of Berlin. Nicolai was sentenced to five months in a fortress for his arguments against the ninety-three professors who signed the famous manifesto at the beginning of the war at the behest of the Emperor, and who have attempted to show that war is necessary because historic, racial and required by the deep and fundamental instincts of man. Through war, they have said, the fitness of nations to survive is demonstrated. Nicolai dared to declare that "The selection effected by war has in these days become negative selection, and modern conditions are most artfully devised to deprive it of all biological usefulness. The result of universal military service in particular is that it is precisely the fittest who succumb." The survival of the fighting instinct into the modern world, unmodified, is a handicap and a danger. "One race of animals after another has perished because it *could* not change. Is man now to perish because he *will* not change?" In other words, that species dies out which cannot adapt itself to a changed environment. "There has been nothing so melancholy in this war as the violation of Belgian neutrality, the U-boat campaign, and the use of suffocating gases. For these things are fatal, not only to human life, but to human honor." Speaking of the Kaiser's frequent appeals to God, in accordance with the ineradicable Teutonic idea that something like justice prevails in war, rather than big battalions, Nicolai boldly declared that the cultured believer wondered how the Kaiser could pretend to exploit his God for his egoistic ends, and use Him as the palladium of his right, whether real or imaginary. He affirmed that this must be an obsession of an uncultured and superstitious man.

Nicolai gives the lie to those who would steep the world in a mad hate. No man living today should command more admiration and respect. Especially should the medical profession hold him in the highest honor, for he is a physician.

Hats off to Nicolai, man, physician, Teuton!

The Medical Spiritualist.

Conan Doyle has taken to describing the world of spirits in familiar fashion. He has definitely joined the ranks of those who believe in the existence of spirits. It is hard to understand why men like Doyle espouse such beliefs, for the phenomena of spiritualism are merely manifestations of the subconscious minds of mediums. There is nothing supernatural about mediumship.

The world war is proving too much of a strain upon some elderly minds once noted for their peculiar vigor.

Of course, Doyle is taken more seriously as a writer than as a physician, and what he may choose to do cannot be taken as involving the medical profession in any way.

Recently, the spiritualists have been crowing a good deal about a message purporting to be from Jenner, in which vaccination is said to have been condemned as worthless. We presume that Conan Doyle has been properly impressed by this communication.

Normal men could imagine a message such as that alleged to have come from Jenner being concocted by some humorist, but no humorist has ever been known to be a spiritualist. The spiritualist is always, perforce, one who is humorless. It is certain that the message we have mentioned was given out in deadly earnest.

By the way, has any one ever encountered any humor in the books of Conan Doyle?

The Aftermath of War.

As always, war is still leaving more disease in its wake among the combatants than injuries. Out of every 1,000 men put out of action among the forces of the British Empire, 453 are rendered unfit by injuries and 547 by disease. The 453 injuries analyze as follows: 32 loss of sight; 49 loss of an arm or leg; 264 serious injuries to the extremities; 50 head injuries; 58 miscellaneous. The 547 diseases are made up in part of 124 affections of the chest, one half being tuberculous; 110 are heart maladies, and 67 represent nervous troubles, of which 11 are epilepsy and 9 insanity.

Medicine and the Impending Changes in the Social Order.

How can the men who have lived in the trenches and fought at the front ever take up their lives again in anything like the same environment? The answer is, they cannot. For at the front they have shed the veneer of civilization and have been revealed to each other as primitive men and brothers after all. The facing of tremendous realities, dangerous and otherwise, has transformed them psychically and physically. They have become courageous, simple, religious, free, and *natural*. They have seen the English archers of another day in the skies, and they have seen crosses there too—men ought to see visions in the heavens and fairies in trees, which is only to say that they should see trees and the skies and cherish "superstitious" notions about them. Thou man of civilization, "Alas! thine is the bankruptcy":

"Whence, O thou orphan and defrauded?
Is thy land peeled, thy realm marauded?
Who thee divorced, deceived and left?
Thee of thy faith who hath bereft,
And torn the ensigns from thy brow,
And sunk the immortal eye so low?
Thy cheek too white, thy form too slender,
Thy gait too slow, thy habits tender
For royal man;—thee they confess
An exile from the wilderness,—
The hills where health with health agrees,
And the wise soul expels disease."

Germany and Austria—that is, the governments of those benighted countries—are said to fear a separate peace with Russia because of the consequent return of their men, who, while held captive, have imbibed the air of freedom and the philosophy of the new democracy. But the master classes in other belligerent countries have also reason to fear the return of their own soldiers now at the front, for they will return with no patience to bestow

"On clucking hens and prating fools,
On thieves, on drudges and on dolls."

And they will pay scant respect

"To upstart wealth's averted eye;
To supple office, low and high;
To crowded halls, to court and street;
To frozen hearts and hasting feet."

To these glorious pagans we must look for the scrapping of the palliative devices of civilization in the abominable service of which certain uplifters would enlist the medical profession. They shall be our liberators.

The Passing of Oleum Ricini.

Now that castor oil is disappearing from the market on account of its large use as a lubricant in operating aeroplanes, it is interesting to speculate upon the effects of its withdrawal. Its therapeutic usefulness is so great that it has seemed like one of the indispensables, and yet we shall have to muddle along without it. Many situations can be readily imagined in which its unobtainableness will work clinical hardship. At the same time it is likely that the conditions in which its use is indicated will be less frequently met wth, since the people's eating habits have been greatly reformed, of necessity, by reason of war stringency. Certainly there is less stuffing of children with the substances notorious as causative of acute intestinal disturbances.

Pruritus vulvae or ani are not necessarily connected with diabetes and are not a part of the diabetic condition if the infection is found, and there is no general pruritic condition of the skin. This is still subjudice.—MURRAY.

Miscellany

CONDUCTED BY ARTHUR C. JACOBSON, M. D.

The Goose Step in Medicine.

Crothers condemns (*American Medicine*) what he calls the failure and hesitation of the medical profession to defend the teachings of science, particularly when they are opposed to the theories of courts and the delusions of the present. Alcohol in certain clinical circumstances is a conspicuous example of a thing about which such a failure and hesitation are in much evidence, save on the part of a few of its doughty defenders. Sweeping arguments against the employment of other useful poisons, such as morphine, could be brought even more effectively than in the case of alcohol. If it should happen that certain all-powerful social forces arrayed themselves against these other poisons, who can doubt that the profession would fall into line and do the goose step most obediently. Then would be witnessed the edifying spectacle of the rank and file repudiating morphine, and then would be heard the voices of a thin remnant crying out in the wilderness. And then the voices would fade away.

These are days of standardization and centralization. The "art" of therapeutics is to be standardized and the "artists" must take into account the rulings of a medical autocracy. Individualism is to be crushed and science made to conform to bureaucratic dicta, inspired in many cases by extra-professional forces.

Nutritional Mysteries.

We wonder how the Germans manage their nutrition problem, supposedly half starved as they are, but the mystery is probably no more profound than that inherent in the problem of the worker about whom we used to wonder before the war—we mean the man with a wife and several children and a small wage. How he and his family ever got along on his earnings was as great a puzzle as how the German gets along in war time.

"Who's Looney Now?"

A good story is going the rounds about one of our most noted experts in feeblemindedness. In view of the shortage in domestic labor, the doctor had procured a feebleminded girl from an institution with which he was connected, to aid in the housework in his home. It took this feebleminded girl about two weeks to discover that the doctor himself had a guardian. She found that he was quite helpless about many little practical matters, and that his wife's intelligence and care met his shortcomings tactfully in a dozen directions. One day the girl confided to her mistress that the doctor seemed to her to be "kind of simple about some things."

This incident, it seems to us, possesses a significance that ought not to be lost upon us. Tests for feeblemindedness ought to take chiefly into account what an individual has had to do and to be by reason of environment, and not what he has never done and never been. This might apply even to simple puzzles, the arranging of forms, the naming of the date, etc. The same immigrant who might fail in such matters has perhaps made a living out of half an acre of land on the side of an Italian volcano. If some of our experts were to be tested by criteria foreign to their experience in life they might fail in the eyes of some of those

whom they have rated as feebleminded. Suppose the aforesaid immigrant were to take the expert to his mountain farm and try him out thereon, what might not happen?

The End of the Sanger Case.

The following decision of the Court of Appeals of the State of New York sustains our contention from the beginning that there is nothing in the existing laws which does other than safeguard regular practitioners of medicine when for good and sufficient reasons, and in an ethical manner, such practitioners invoke contraceptive measures. Hygienic birth control is now formally recognized by the courts as a legitimate professional procedure, and this recognition is based upon already existing law. The efforts of malodorous agitators to make the profession believe that their rights were in jeopardy, and to enlist the aid of well-meaning reformers in their sinister attempts to change the existing law, now stand clearly revealed in their true light.

COURT OF APPEALS.

Decided January 8, 1918.

THE PEOPLE OF THE STATE OF NEW YORK, respondent, v. MARGARET H. SANGER, appellant.

A claim that the statute against advertising or offering for sale any article for the prevention of conception is unconstitutional in that it might interfere with proper medical treatment in the case of a married woman is not available as a defense to one convicted of violating the statute who was not a physician (Penal Law, sec. 1142). Furthermore, physicians are excepted from the provisions of the act under circumstances therein mentioned, and this would extend to a druggist or vendor acting under their order (sec. 1145).

An appeal by the defendant from a judgment of the Appellate Division, Second Department, affirming a judgment of the Special Sessions convicting the defendant of violating section 1142 of the Penal Law.

Jonah J. Goldstein for appellant; Harry G. Anderson for respondent.

CRANE, J.—Section 1142 of the Penal Law, among other things, makes it a misdemeanor for a person to sell or give away, or to advertise or offer for sale any instrument or article, drug or medicine, for the prevention of conception; or to give information orally stating when, where or how such an instrument, article or medicine can be purchased or obtained.

The appellant was convicted in the Court of Special Sessions of the City of New York, Borough of Brooklyn, for a violation of this section and sentenced to thirty days in the workhouse. She claims that the law is unconstitutional.

Some of the reasons assigned below for the illegality of this act have now been abandoned, and it is conceded to be within the police power of the Legislature for the benefit of the morals and health of the community to make such a law as this applicable to unmarried persons. But it is argued that if this law be broad enough to prevent a duly licensed physician from giving advice and help to his married patients in a proper case it is an unreasonable police regulation and therefore unconstitutional. There are two answers to this suggestion.

In the first place, the defendant is not a physician, and the general rule applies in a criminal as well as a civil case that no one can plead the unconstitutionality of a law except the person affected thereby (Collins v. State of Texas, 223 U. S., 288, 296; People v. McBride, 234 Ill., 146, 164; Isenhour v. State, 157 Ind., 517, 520; People v. Haskell, 84 Vt., 429, 441; Commissioners of Franklin Co. v. State ex rel. Patton, 24 Fla., 55).

Secondly, by section 1145 of the Penal Law, physicians are excepted from the provisions of this act under circumstances therein mentioned. This section reads: "An article or instrument used or applied by physicians lawfully practicing or by their direction or prescription for the cure or prevention of disease is not an article of indecent or immoral nature or use within this article. The supplying of such articles to such physicians or by their direction or prescription is not an offense under this article."

This exception in behalf of physicians does not permit advertisements regarding such matters, nor promiscuous advice to patients, irrespective of their condition, but it is broad enough to protect the physician who in good faith gives such help or advice to a married person to cure or prevent disease. "Disease," by Webster's International Dictionary, is defined to be "an alteration in the state of the body or of some of its organs interrupting or disturbing the performance of the vital functions and causing or threatening pain and sickness; illness; sickness; disorder."

The protection thus afforded the physician would also extend to the druggist or vendor acting upon the physician's prescription or order.

Much of the argument presented to us by the appellant touching social conditions and sociological questions are matters for the Legislature and not for the courts.

The judgment appealed from should be affirmed.

HISCOCK, Ch. J.; CHASE, COLLIN, CARDOZO and ANDREWS, JJ., concur; HOGAN, J., concurs in result.

Judgment affirmed.

The Diagnostic Laboratory

Conducted by CHESTER T. STONE, M. D.,
Brooklyn, N. Y.

Tests for Novocain.

Sanchez is professor of analytic chemistry at the University of Buenos Aires. He describes a number of means to identify novocain, and to estimate the purity of a specimen. He determines the latter by dropping a 0.2 per cent. solution of the novocain into a solution of 0.8 gm. bromin in 1,000 cc. water. When pure, the novocain solution decolors a certain volume of the bromin solution.—(*Lemana Med.*, Sept. 17.)

Method for Distinguishing Urinary Sediments.

In order to distinguish the various urinary sediments more easily from each other, Lipp-Weingarten (*Sudd. Apoth. Zeit.*) recommends adding to 10 mils of the urine, 3 drops of a 5 per cent. aqueous solution of anilin blue and then 6 to 8 drops of a 25 per cent. solution of eosin in glycerin, to which 5 per cent. of liquefied phenol has been added. The mixture is then centrifuged, and the sediment placed under the microscope. Leococytes, epithelial cells, casts, etc., are each colored characteristically—(*Medical Adviser.*)

Diluting Fluid for Counting Blood Corpuscles.

Jacob Diner says the need of a good diluting fluid for the purpose of counting blood corpuscles has often been impressed on me while working in the laboratory and in hospitals. Those mentioned in textbooks have

many drawbacks. Some form a precipitate on standing; others while remaining clear do not permit of the addition of staining solutions so that the white corpuscles may be differentiated from the red corpuscles while making the count; still others destroy the red corpuscles if the diluted blood is permitted to remain in the counting pipet for some hours.

With the object in view of securing a fluid which will do away with the objections mentioned, I have done some work along this line and have obtained what I believe to be an ideal diluting fluid. This fluid permits of the simultaneous counting of white and red corpuscles; it keeps indefinitely without precipitating; it retains the normal shape of the corpuscles, and the diluted blood kept in the diluting pipet for over a week was as perfect as when first drawn. The formula is as follows:

Sodium chlorid	0.85	gm.
Sodium citrate	2.00	gm.
Azure II	0.001	gm.
Formaldehyd solution, U. S. P...3		drops.

Distilled water enough to make 100 c.c.

The sodium salts are dissolved in the water, the formaldehyd solution is added, the azure is added, and it is shaken well. It may be kept in any kind of a bottle.

The technic of using it is the same as with Toison's, Hayem's, or any other fluid. The findings are computed according to the degree of dilution.—(*Jour. A. M. A.*, Oct. 27, 1917.)

Wassermann and Spinal Fluid Tests.

The author presents a study of 203 cases: 43 paresis, 34 tabes, 27 cerebrospinal syphilis, 4 congenital syphilis, 11 meningitis, 3 tetanus and 81 other nonsyphilitic organic and functional conditions. The characteristic paretic curve of the colloidal gold reaction was found in 42 cases out of 43 spinal fluids examined. Four cases gave a negative Wassermann in the blood; all showed a marked positive globulin test; all but 5 had a lymphocytosis of over ten cells per cubic millimeter. Of the three atypical reactions, 1 occurred in a very early case, 1 was probably due to an old and infected spinal fluid, and 1 was made after vigorous intraspinal therapy.

In the miscellaneous group (76 cases) all findings were practically normal. The Wassermann in the spinal fluid in all cases was negative. One blood gave a positive Wassermann, the cell count was normal except in 2 cases of meningismus, in 1 brain tumor and in 1 spinal cord tumor; the globulin test was negative in all but 1. The colloidal gold test showed nothing definite except occasionally a slight decolorization in the lower dilutions. In 3 cases of multiple sclerosis all findings were negative, but in 1 case the colloidal gold test showed a typical paretic curve with a negative Wassermann test.

The effects of antisyphilitic treatment on these tests have been variable. In the main the syphilitic cases have been treated with salvarsan, intravenously and intraspinally (Swift and Ellis method), combined with mercury. In all cases there has been a gradual reduction of the cell count to normal. In the majority of cases the globulin test has become normal while in some it remained slightly positive. In 21 cases of paresis, treated thoroughly, all but 2 gave a negative blood Wassermann. However, in the spinal fluid it persisted positive in every case. Out of 22 cases of tabes treated, 16, or 73 per cent., gave a negative Wassermann both in the blood and spinal fluid. In only five instances of all antisyphilitic cases treated did the author notice any change in the colloidal gold curve, and in only 1 case did the curve become normal. Hammes concludes that no spinal fluid test (except the presence of bacteria) is specific. Every test is simply that much cooperative evidence and should be combined with the history of the case and the clinical findings.—(*Am. Jour. Med. Sci.*, Nov., 1917.)

Complement Fixation.

The phenomenon of complement fixation, as seen in the Bordet Gengou experiment, has been studied from the immunological point of view, and is explained in general terms as a specific antigen-antibody complex, claiming the complement for itself, so that when a hæmolytic system is added, the amount of complement available is insufficient for the solution of the red corpuscles. The physico-chemical nature of the reaction has attracted much attention, and various characters have been noted, without any definite conclusion having been reached. There is reason for assuming that the antigen-antibody reaction is governed by the same laws as those which determine the deflection of complement from one system to another. Hitherto, all attempts to find an adequate explanation for the complement fixation in the reaction devised by Wassermann has failed, since it has been shown that the syphilitic antigen can be replaced by a non-specific lipoid. In the Bordet-Gengou phenomenon the essentials are an antigen-antibody system and a hæmolytic system, with sufficient complement to satisfy one or the other. There is therefore a fundamental difference between the syphilitic reaction and this phenomenon. R. M. Walker has sought to overcome the difficulty in explaining the Wassermann reaction by assuming that it is governed by the laws of colloids. He sets out to demonstrate the probability that the "antigen" and the antibody are colloids. The lipoid solution certainly behaves like a colloid of the nature of the suspensoids, which are flocculated by the action of electrolytes; this flocculation takes the form of "gel" production. It is evident that the author is on less secure ground when he attempts to establish the colloid nature of the antibody. He admits the teaching that antibody is attached to the globulin fraction, but that takes him no nearer the solution he is seeking The view of Wassermann that antibody is of a proteid nature and that of McDonagh that it is either of lipoid or protein-lipoid nature, are too speculative to be accepted without further evidence. His contention that as antibody is not dializable, it must belong to the emulsoid class of colloids, is mere guesswork.

Turning to the deflection of complement, he examines the phenomenon from the view of selective adsorption, and adduces some interesting evidence in support of this view. In the first place, if part of the complement be added to the syphilitic system and incubated for 1½ hours, after which time the remainder is added, the mixture contains sufficient unbound complement to dissolve red cells. Inactivated guinea-pig's serum, inactivated rabbit's serum, and solution of white of egg, also suffice to satisfy antigen-antibody system, so that no further complement can be bound. In the next place, he demonstrates by means of a curve that the amount of complement absorbed increased absolutely and not relatively to the amount of complex present. He has thus made out a good case, that the reaction between the antigen-antibody complex, which is partially, if not completely, of a colloidal nature, and the complement can be explained as a selective adsorption, which does not come into play when normal serum instead of syphilitic serum is used. (*Med. Jour. of Australia*, Sept. 29, 1917.)

62 Pierrepont Street.

Special Article

Acute Lobar Pneumonia.

Avery, Chickering, Cole and Dochez have been doing wonderful work in the study of pneumonia. Their monograph on the subject, No. 7, Rockefeller Institute of Medical Research, is a masterpiece. In discussing the etiologic diagnosis they observe that since it is now known that certain cases of pneumonia may be successfully treated with the serum of immune animals, provided that the organism used in preparing the serum is identical with that causing the infection, etiologic diagnosis becomes imperative. Practical and quite rapid methods have now been devised for the detection of the organism causing the disease, even for the differentiation of the specific types of pneumococci. This etiologic diagnosis is, however, not only of importance in relation to serum therapy, but has an important bearing on prognosis and is essential for acquiring knowledge concerning the epidemiology of this disease.

For the determination of the etiologic agent in cases due to other organisms than pneumococcus, the same general methods are applicable as in cases due to pneumococcus. In certain cases, as those due to Friedländer's bacillus, streptococcus, or staphylococcus, the microscopic examination of the sputum gives much information and cultures of the sputum made on agar plates may show a great predominance of the organisms causing the disease. When the sputum from these cases is inoculated into a mouse these organisms outgrow the ordinary mouth saprophytes just as do pneumococci. Blood cultures from the patient, when positive give, of course, clear evidence as to the nature of the infection.

In the cases due to pneumococcus it is important not only to determine that the infection is due to this bacterium, but it is also of prime importance to determine the specific type of pneumococcus causing the infection, since treatment with serum is only applicable in the cases due to type I organisms. The authors give a careful description of the various procedures employed in the isolation of pneumococci and determination of the specific types. The types of the pneumococcus are determined by the agglutination or precipitation methods, although type III can be identified morphologic and cultural differences. There is also explained the determination of types of pneumococcus in blood cultures, spinal fluids, empyema fluids and by lung puncture, and by means of specific precipitin reaction in the urine.

Significance of Pneumococcus Septicemia.

The suggestion has been made that lobar pneumonia is primarily a blood infection, and that the local process in the lung is but part of a generalized condition. This view has arisen from the discovery that pneumococcus may at times appear in the circulating blood of persons suffering from lobar pneumonia. In the cases of lobar pneumonia studied in the Hospital of the Rockefeller Institute, pneumococcus has not been found in the blood in all instances. In those cases in which a positive culture was obtained, the course of the infection has been invariably severe and in many instances the disease terminated fatally.

In Table I are presented the results of blood cultures in a series of 448 cases of lobar pneumonia at the Hospital of The Rockefeller Institute.

TABLE I.

Relation of Positive Blood Cultures to Mortality in Pneumonia.

Type of pneumococcus.	No. of cases examined.	Blood Cultures: Positive.		Blood Cultures: Negative.		Mortality: Cases with positive blood culture		Mortality: Cases with negative blood culture	
			per cent		*per cent*		*per cent*		*per cent*
I	145	50	34.5	95	65.5	13	26.0	3	3.1
II	148	49	33.1	99	66.9	36	73.4	9	9.0
III	55	16	29.0	39	71.0	16	100.0	11	28.2
IV	100	21	21.0	79	79.0	11	52.3	3	3.8
Total ..	448	136	30.3	312	69.7	76	55.8	26	8.3

Examination of Table I shows that of 448 cases of lobar pneumonia, pneumococcus was obtained from the blood in 136 instances, or 30.3 per cent. In the 136 cases with positive blood culture the mortality was 55.8 per cent., whereas in 312 cases with negative blood culture the mortality was but 8.3 per cent. These figures seem to show that the presence of pneumococcus in the blood during lobar pneumonia indicates a severe infection and is of bad prognostic significance.

The type of pneumococcus obtained from the blood has an important bearing on the outcome of the disease. In 50 cases in which Type I pneumococcus was obtained from the blood, the mortality was 26 per cent. The fact that this figure is so low is undoubtedly dependent upon the fact that a large number of these cases were treated with antipneumococcic serum Type I. Of 49 cases in which Type II pneumococcus was obtained from the blood, the mortality was 73.4 per cent. Of 16 cases in which Type III pneumococcus was recovered from the blood, the mortality was 100 per cent. Of 21 cases in which Type IV pneumococcus was found in the blood, the mortality was 52.3 per cent. These figures indicate that, with the exception of infections with Type I pneumococcus, in which case specific serum is efficacious, the more virulent the type of pneumococcus obtained from the blood, the less is the likelihood of recovery.

Our experience has been that the greater the number of colonies of pneumococcus that develop from 1 cc. of blood when plate cultures are made, the more likely the disease is to have a fatal termination. The following figures indicate the significance of increasing numbers of pneumococci per cc. of blood. The illustration is drawn from our experience with plate cultures made from the blood of individuals with Type II pneumococcus infections. Of 14 cases in which the numbers of colonies were from 1 to 15 per c.c. of blood, 6 died, a mortality of 43 per cent.; of 2 cases with 15 to 30 colonies per c.c., 2 died; of 4 cases with 30 to 75 colonies per c.c., 4 died; of 16 cases with more than 75 per c.c., 16 died. It is thus seen that all cases of Type II infection in which the number of colonies per c.c. of blood was 15 or more were fatal. This figure, of course, is not to be considered as absolute, but serves to show that cases of Type II infection with considerable numbers of pneumococci per c.c. of blood are almost invariably fatal. In some cases of lobar pneumonia, invasion of the blood may occur as late as the 5th or 6th day. A number of these cases are rapidly fatal and study of the blood has shown that the numbers of pneumococci per c.c. of blood increased with extraordinary rapidity, the number of colonies in many instances running up into the thousands.

The study of these results leaves little doubt that invasion of the blood by pneumococci in any type of lobar pneumonia is a serious matter, that the seriousness of this invasion is proportional to the virulence of the type of organism, and that the greater the number of organisms present, the more likely is the disease to have a fatal outcome.

Antipneumococcic Serum.

An antipneumococcic serum is only protective and curative provided it is employed to combat an infection due to the same type of organism as that used in its production. We also know that to cure after infection has once occurred, the serum must be employed in very large amounts and preferably injected intravenously.

The discovery of these facts, together with the development of methods for making an etiologic diagnosis in every case, made it advisable to undertake again the treatment of cases of pneumonia with the serum of horses immunized to the various specific types. These attempts have resulted in the demonstration that antipneumococcic serum, prepared by the injection of Type I pneumococcus, is highly effective in the treatment of cases of pneumonia due to the same type of organism. The serum of Type II is much less efficacious. Indeed, it has not yet been thoroughly demonstrated whether it has any practical effect on the outcome of the disease or not. Immune serum may be prepared by the injection of Type III, pneumococci and this serum has slight agglutinating power and slight protective power for animals. This power, however, is so slight that the therapeutic application of this serum has not been considered promising or justifiable. From what has previously been stated it would be impossible to prepare a serum which would be effective against any considerable number of cases of infection due to Type IV pneumococci.

An interesting description of the production of the serum is given as well as the methods for its storage, dispensing and standardization.

Indications for Serum Treatment.

It has been proposed by others that immediately after admission to a hospital or after coming under the care of a physician and before the type of infection is determined, every patient should receive a large dose of antipneumococcic serum of Type I or a polyvalent serum containing antibodies to Type I pneumococcus. The purpose of employing this method is to avoid the delay incident to the determination of the nature of the infection. Later, if the infection proves to be due to Type I pneumococcus, the treatment may be continued; otherwise it may be stopped. The administration of serum is frequently followed by general constitutional reactions and, if this method were employed, many patients in whom the serum could be of no possible value would be subjected to these reactions. The time gained would not be great, since, in most cases, the type of infection can be determined within 6 to 18 hours, and during this time, if the patient is sensitive to horse serum, he can be desensitized. Pneumonia is the easiest of

the acute infectious diseases to diagnose. If the importance of early diagnosis and of type determinations were generally recognized, serum treatment could be commenced very early in most patients, even though the etiologic diagnosis caused slight delay. The authors, therefore, believe that except in emergencies the administration of serum should only follow the determination of the nature of the infection.

As soon as the type of pneumococcus responsible for the infection has been determined, if it proves to be Type I, serum treatment should be undertaken at once in all cases, except in very young children who appear but little intoxicated by the infection and in whom the prognosis is good and the difficulty of treatment great. In the case of adults, first seen late in the disease, apparently mildly ill, and already showing signs of decreasing fever and intoxication, serum treatment may also be unnecessary. When cases are seen late in the disease, still very ill, one should be extremely careful to eliminate complications as the cause of the symptoms. Occasionally one is tempted not to use serum, or at least to wait a day or two, in cases which seem relatively mild at onset. This is believed to be most unwise, as frequently the pathologic process spreads insidiously, giving little evidence of intoxication for several days, when suddenly the picture changes, the pulse, temperature, and respiration rise, cyanosis deepens, and the end comes too soon to be influenced by the tardy use of the specific serum.

Occasionally one first sees a case at a time when consolidation of another lobe is taking place. At such a time the temperature may perhaps be lower and the heart rate and respirations slightly less rapid than previously. On the other hand, the general appearance of the patient does not seem reassuring; he may appear prostrated, and the extremities may be moist and clammy. In a few hours the temperature rises again, and the following day the signs of more extensive consolidation may be more apparent. These cases especially need immediate treatment when first seen if the further spread of the disease is to be prevented.

Administration of Serum.

Antipneumococcic serum can be administered most easily in a hospital, but may be given anywhere.

Following the administration of foreign serum, especially the large amounts necessary in this form of therapy, the patient may exhibit certain symptoms which are entirely due to the foreign protein and have nothing to do with the content of the serum in antibodies. This reaction is identical with, or at least analogous to the so-called anaphylactic reactions seen in animals. It is very important that, before serum is administered, every effort should be made to ascertain whether patients are highly sensitive to horse serum, in order that such reactions may be guarded against. The detection of serum sensitiveness is not difficult. Every patient with pneumonia, immediately on admission to the hospital or after coming under the physician's care, should receive proper tests to determine this fact, since, if he proves to be infected with Type I pneumococcus, serum should be administered.

The patient is first questioned for a history of previous injections of immune sera for diphtheria, meningitis, or for tetanus infections. He is also questioned concerning previous symptoms suggesting asthma or hay fever, since persons having such symptoms are likely to be sensitive to various proteins, including those in serum. In any event, however, an intradermal skin test is performed.

Intradermal Skin Test.—The skin, preferably over the forearm, is carefully cleaned with soap and water and alcohol, taking care not to make the skin red or inflamed. If the skin is gently patted, instead of rubbed, with a gauze sponge, no irritation develops. With a small syringe, preferably of the type used for tuberculin injections, and a fine needle, about No. 28 gauge, 0.02 cc. of sterile diluted horse serum (normal or immune), diluted with salt solution 1:10, is injected *into* the skin, not subcutaneously, so that a small white wheal about 3 mm. in diameter showing the little depressions of the hair follicles is produced. An injection of a like amount of sterile salt solution is made as a control.

The points of injection should be observed at intervals for 1 hour. Usually after a few minutes the wheal produced by the salt solution disappears, leaving no alteration in the skin except the small needle puncture. If the test is negative, that is, if no evidence is obtained of horse serum sensitiveness, the wheal produced by the serum injection fades away also almost as rapidly. On the other hand, if sensitiveness does exist, usually within 5 minutes a genuine urticarial wheal begins to develop, which may increase slowly in size up to that of a half dollar, the wheal in turn being surrounded by a larger area of erythema. This lesion usually reaches its maximum extent within 1 hour and fades away rapidly, disappearing entirely within a few hours. A faint erythema may persist for a day or more. There are usually no subjective symptoms from this intradermal injection, except occasionally slight itching at the point of injection. Very rarely, in individuals extremely sensitive to horse serum, the injection of this small amount of serum, 0.002 cc., has been known to produce general symptoms, flushing of the face, increased rapidity of the heart rate, and respiratory discomfort.

Desensitization.—For purposes of desensitization, it is advisable to inject 0.5 to 1 cc. of antipneumococcic serum or sterile normal horse serum subcutaneously into every pneumonia patient as soon as the skin test is completed, even though the intradermal skin test is negative, for occasionally one sees a patient in whom the skin test appears to be negative and yet in whom, on the injection of large amounts of serum, slight symptoms of serum sensitiveness appear. If the intradermal skin test is positive, indicating that the patient is sensitive to horse serum and if the infection is due to Type I pneumococcus, in which case the patient should receive serum treatment, a more thorough method for desensitization must be employed. This should consist in giving extremely small amounts of serum subcutaneously at one-half hour intervals, doubling the size of the dose at each injection. One can safely begin with the injection of 0.025 cc. of serum. If no reaction follows the injection of 1 cc., subsequent doses may be given intravenously, also at one-half hour intervals, beginning with 0.1 cc. and doubling the dose at each injection. If a general reaction occurs, or cyanosis, dyspnea, or increased rapidity of the heart rate supervenes, the injections should be suspended for 2 to 4 hours, depending upon the severity of the reaction, and then be resumed, starting with the same dose as that producing the reaction. After 25 cc. of serum have been given in these small doses, after a lapse of 4 hours, 50 cc. may be given, followed by the regular dose 6 to 8 hours later. The desensitization of a patient is a tedious and time-consuming procedure. Fortunately one rarely is called upon to employ this measure. It has been found necessary to desensitize in this way only two or three patients in a series of over 150 cases.

Technique of Treatment.—In preparing for the intravenous injection of serum it is best to have a sterile field. The apparatus for injecting consists of the following:

1. Sterile container for mixture of antipneumococcic serum and sterile freshly distilled normal salt solution.
2. Rubber tubing, 4 feet long, and a three-way stop-cock.
3. Short piece of glass tubing for a window.
4. Rubber stopper with double holes through which are thrust two pieces of glass tubing. One tube is long enough to reach nearly to the bottom of the container, and through this air enters the container when the latter is inverted. The other shorter glass tube forms the outlet for the serum.
5. Two sharp needles and needle holder.
6. One 20 cc. Luer all glass syringe.
7. One 2 cc. Luer all glass syringe with hypodermic needles.
8. Thum forceps.
9. Medicine glass.

The serum should be warmed before injection to slightly above body temperature. It has been customary to dilute the antipneumococcic serum with equal parts of sterile freshly distilled (glass still) salt solution just before the injection is made. This makes the serum less viscous and facilitates its flow through the tubing. The serum is then transferred to the container by means of a sterile pipette. In this way the transference of the small amount of sediment which is always present in the bottom of the bottle (if care has been taken to prevent shaking) can be avoided.

Having filled the container, the cork is inserted and prevented from falling out by strips of adhesive tape. The bottle is inverted and attached to the side of the bed or to an irrigating stand. After allowing the serum to fill the tubing, the needle is introduced into a convenient vein, the overlying skin being previously cleansed with iodin and alcohol. If one has facilities for making blood cultures, it is wise to take about 10 to 15 cc. of blood for blood culture before beginning the serum injection. The serum may be allowed to run very slowly by gravity, but may be more easily and accurately controlled by aspirating it into the syringe and then in turn injecting it into the vein. In this way it is possible, and indeed advisable, that the steady and slow injection of the first 10 to 15 cc. of serum should occupy 10 to 15 minutes. During this period one watches carefully for any change in the patient's appearance and for increased rapidity of the pulse, respiratory difficulty, pallor, cyanosis, or urticaria. If these symptoms appear, it is well to stop the injection of serum for a few minutes, 15 to 20, to see if the symptoms increase in severity. Usually they rapidly disappear and the injection can be resumed. The needle can be easily kept free from clots by slowly injecting salt solution with the detached syringe.

Except in very rare instances, no symptoms arise during the

injection of the first 10 or 15 cc. of serum, and the injection may then be completed more rapidly in 10 to 15 minutes. With nervous individuals, the infiltration of a small area of the skin with 1 per cent. cocain or novocain solution renders the procedure painless.

Dosage and Frequency of Treatments.

For antipneumococcic serum to be effective it must be given in large doses and intravenously and the amount of serum necessary will vary in each case. At present we have no means of deciding in the individual case what the primary dose should be. Neufeld decided that in the average man the dose should be about 75 cc. The authors have established more or less arbitrarily an initial dose of 90 to 100 cc. The frequency and size of the succeeding doses must be regulated largely by the effects obtained from those preceding. It is extremely important that once having started specific treatment, it should be continued until a definite favorable result has been obtained and, in order to accomplish this, the serum should be given every 8 hours in doses of 90 to 100 cc. unless there are indications to the contrary. The average total amount of serum required in their cases treated during the past winter has been about 250 cc.

In a considerable number of cases, within 20 minutes to an hour following the injection of serum there occurs an elevation of temperature, followed by a marked fall. If the temperature continues low and the patient's condition is good, no further administration of serum is necessary. These patients, however, must be very carefully watched. The temperature should be taken every 2 hours and, if the temperature luring the next 24 hours rises to 102 degrees F. or over, a second dose of serum should at once be administered. If no fall of temperature occurs following the first dose, or if it does not fall to 102 degrees F. within 8 hours, the second dose of serum should then be given. It is obvious that this rule should not be absolutely hard and fast, for the temperature is not the only guide to the patient's condition.

If, following the second dose of serum, no reaction occurs, within 8 hours another similar dose should be administered, and this should be repeated as often as necessary. The patient should be observed day and night and the treatments should be given at night as well as by day whenever necessary. In the cases in which no reaction is obtained after several doses of serum, great care must be exercised to detect the presence of complications such as empyema or otitis media, to which the persistence of temperature may be due and on which the failure of the serum to act depends.

The injection of serum may be followed by several types of reaction; first, the true anaphylactic reaction; second, the so-called thermal reaction, and finally, usually at a later period, the symptom complex called serum sickness or serum disease. These conditions are described by the authors at length. They also discuss the supplementary therapeutic measures.

The final test of the effectiveness of immune serum must rest on the evidence concerning the saving of lives. Although the number of cases so far treated in the Hospital of The Rockefeller Institute is not large, the results obtained have been so striking that, taken in connection with the other evidence presented, and supported, as they are, by the observations of others, they indicate almost certainly that the serum as employed by us has a marked curative effect in the treatment of pneumonia of Type I. Up to the present time 107 cases of lobar pneumonia of this type have been treated with serum, and of these but 8 have died, 7.5 per cent. When this is contrasted with the mortality of 25 to 30 per cent., as observed in the authors' cases before they commenced serum treatment and in the cases observed elsewhere, the results obtained are definite and striking.

The results obtained by others in small series of cases in hospitals in New York, Boston and Pittsburgh, where the treatment could be carried out with proper attention to details, have also been definite and satisfactory. Last fall on the Mexican border Major H. J. Nichols, U. S. Army, treated 63 cases occurring among the soldiers. Of these 63 cases, 5 died, a mortality of 8 per cent. Among 18 cases with Type I infection not treated with serum 7 died, a mortality of 39 per cent. From his experience Major Nichols concluded that "no patient with Type I infection who dies without the early intravenous administration of large doses of Type I serum can be said to have received the best treatment."

Sawyer writes:

"Fatness of abdominal walls and abdominal contents favours constipation, while constipation disposes to fatness and especially to intra-abdominal fattiness. Here is a vicious circle, of therapeutic suggestiveness."

Public Health

The Prevention of Milk-Borne Diseases.

Surgeon E. A. Sweet, U. S. P. H. S., says that an important consideration in the production of milk is to avoid the entrance of dirt and bacteria thereto. At first glance this would seem to be a difficult procedure and many dairymen have become discouraged over the expense involved and the prospects of its accomplishment. In reality, however, the requirements are exceeding simple, easy of application, and can be put into operation without undue expense. The following are the essentials:

1. Healthy stock: Good milk, of safe quality, can be secured only from healthy stock. If cows are diseased, their secretion is apt to contain abnormal constituents or even disease-producing organisms themselves. Gastroenteritis in cows, septic fevers, inflammation of the udder, and the presence of any one of a number of other diseases is invariably sufficient reason to warrant the discontinuance of the milk as a food.

2. A careful milker: Milk that comes in contact with the hands of the ordinary milker is not clean, and the danger of producing disease in this manner is evident. The hands should first be thoroughly washed before the milking is begun, carefully dried, and kept dry during the milking process. The milker should avoid the raising of dust and should prevent the entrance of organic matter into his containers. Carelessness in coughing, sneezing, and the dissemination of secretions is also to be avoided.

3. Only covered or hooded milking pails should be used. The hooded pail prevents the entrance of organic matter from the cow, the milker, and the dust contained in the air, and if it is not used the production of clean milk is impossible. So long as material of this character is intercepted by a properly constructed hood it is free from danger; once it gains access to the milk the harm has been done. The hooded milking pail, with an aperture not over 5 inches in diameter, is therefore to be considered a most important apparatus in the production of clean milk.

4. Sterile containers only should be used. This applies to milk pails, milk cans, strainers, or any other substance with which the milk comes in contact. The ordinary method of washing utensils with soda or soap powder removes dried milk and other gross matter, but does not kill the bacteria which are constantly present. To accomplish this the long-continued application of either steam or boiling water is necessary, the mere rinsing with hot water practiced by the average housewife not being sufficient. After the containers are washed and sterilized, they should be kept in places sheltered from dust.

5. The milk should be properly refrigerated. The equipment necessary for cooling milk either at the dairy or elsewhere is exceedingly simple. An ordinary wooden tub or half barrel supplied with running water at a temperature not above 45°F., or filled with ice water, is all that is necessary. The rapid mechanical coolers are not required; in fact, they but increase the chances of contamination.

To those who are informed it is obvious that many of the steps commonly recommended for the production of clean milk are not enumerated in the above. For example, nothing is said regarding the cleanliness, ventilation, and lighting of the stable, its freedom from manure, the construction of floors, and the character of the milk house. In so far as these conditions have a bearing upon the health of the stock they are worthy of consideration, as in this way they indirectly affect the quality of the milk. They are also more or less of an indication of the care and cleanliness exercised in the production of pure milk. At the same time they are not essential to that production. It is possible to produce clean milk from cows which have not been carefully groomed and in stables which have not all modern equipment. If the dairyman adheres to the principles laid down regarding the health of his stock, the use of the hooded pail, the sterilizing of containers, and the refrigeration, and exercises due care, he will at least produce a fairly clean milk even if the remaining conditions are not distinctly favorable to such production.

In the transportation of milk the cans should be well jacketed and not allowed to stand in the sun at any stage of their journey. During the summer season refrigeration is necessary. Supplies which are not afforded this treatment, even if perfectly sweet, should be regarded with some suspicion. Milk should always be purchased in bottles and never in bulk. In progressive cities the retailing of dipped milk has been prohibited and an important source of disease conveyance thus eliminated. Bulk store milk invariably shows a much higher bacterial count and is more subject to contamination than that supplied in bottles which is distributed to the consumer or pur-

chased in stores. With dipped store milk there is often a lack of care in both the cleaning and sterilization of utensils, usually because the facilities for this work are not available. Refrigeration and cleanliness are also often not of the best, while frequently there is an inordinate amount of dust in the atmosphere, which readily gains access to open cans. The clerks are untrained in the principles relating to the care of milk, and occasionally the living apartments and the grocery are in close connection. All of these conditions greatly favor the entrance of bacteria to the supply and may render it unsafe for consumption.

The care of milk in the home is not the least important of the measures for disease prevention. The container should be removed to the refrigerator as soon after it is received as possible and not be permitted to stand in the sun or even remain at room temperature. The small, insulated boxes which have recently come on the market for the reception of the bottle when delivered serve a useful purpose. Refrigeration at the home is fully as necessary as at other places, and in order to insure a pure supply ice must be used. The temperature of the refrigerator ought not to be above 50°F. All surfaces should be maintained sweet and clean, inasmuch as a dirty and foul refrigerator may be responsible for bacterial contamination.

When received, the milk should preferably be retained in the bottle, but if this is impossible a clean receptacle, kept constantly covered, should be provided. Before the contents of the bottle are removed the lip should be carefully wiped off and if dirt and moisture are present on the cap their entrance to the flowing stream should be prevented. The mixture of a milk with that of a previous day's supply facilitates bacterial growth and is to be avoided. Bottles should not be employed for other purposes than as milk containers. Upon the occurrence of any contagious disease in the house, they should be returned to the dealer only with the knowledge and consent of the board of health.

The majority of progressive communities have established what is known as dairy inspection, a procedure usually carried out by the health department. The sole object of dairy inspection is to make milk safe and thus to insure community protection against disease. The ideal dairy inspection is begun in the laboratory. The bacterial count of each individual supply indicates whether the milk has been carefully produced. In case the milk is found to be satisfactory, no further action is usually deemed necessary and the dairyman, after being made acquainted with the fact that he is producing a good quality of milk, is allowed to continue with the methods which he has adopted. In case the milk is found to be bad, the producer is informed to that effect and an inspection of the dairy made to determine the cause. In many instances it is found that the farmer is ignorant of the methods of producing a pure and safe milk supply, or he may be simply careless. In either case effort is made to see that he adheres to the principles which have been enumerated and which are in the main simple and inexpensive and within the reach of all. If the dealer is unwilling to correct his methods and continues to distribute a milk which is considered dangerous for consumption, his license is revoked.

Supplementing the inspection system certain cities have established what is called the score-card system. The score card has two objects. One is to facilitate the orderly and systematic inspection of the dairy by the health official, the other to afford a concise written record of the conditions found. Dairies are marked on the basis of 100, each item, such as the healthfulness and condition of the stock, the proper care and chilling of the milk, being given so many credits, not all of the items having the same relative value.

In dairies which approach the ideal the total score may reach close to the 100 mark, while in those where sanitary precautions are not observed the score may fall below 40 or even 20. Records are maintained in the health department of the ratings as given from time to time and in certain cities they are published, so that it is possible for every purchaser of milk to ascertain the sanitary status of the dairy from which he is receiving his supply. Ordinarily dairies which maintain an average rating of 80 or more may be considered good, those between 60 and 80 fair, while those which continually fall below 60 belong to a class in which the rules governing the production of safe milk are not observed. The word "pasteurization" is a rather formidable name for a somewhat simple process. Its purpose is to kill the harmful bacteria which milk contains. It has been found that when milk is heated to a temperature of 145° F. and sustained at that point for thirty minutes the disease-causing organisms are killed. If the milk then immediately chilled and further contamination is prevented it can no longer be considered dangerous to health. Milk which has been adequately pasteurized is therefore to be regarded as the safest milk which one can consume.

Milk may be pasteurized either at the distributing station or in the home, the ideal method being pasteurization in the final container. A number of American cities now require that all milk shall be pasteurized, so that large plants where the process is performed are common. The milk bottles may be placed in the inner portion of an ordinary double boiler, the cold water of the smaller receptacle being on the level with the milk in the bottles. The boiler is then placed on the stove and heated until the water in the inner dish reaches a temperature of 145° F., as determined by the thermometer, where it is maintained for 30 minutes. The bottles are then removed and cooled in runing water, being kept sealed until the milk is ready to serve.

When milk is pasteurized on a large scale certain modifications of this method are employed, but the effect produced is the same, all disease-bearing bacteria, such as the tubercle bacillus and the typhoid and diphtheria organisms, being destroyed. The difference between pasteurization and boiling is one of degree only; the former destroys only disease organisms while the latter kills practically all varieties. It would seem that in pasteurization man has found a ready method for the prevention of all milk-borne diseases. The process is not expected to be a substitute for cleanliness, which prevents the access of dirt and bacteria, nor of cold which prevents their rapid increase, but merely to supplement these measures. Inspection of dairies is not to be neglected even when the milk is to be treated in this manner, pasteurization being only an additional and a more thorough safeguard which compensates for failure of inspection to afford absolute protection. The single remaining safeguard against the transmission of diseases by milk to be considered is boiling. This is the simplest and easiest of all processes to perform and it insures practically absolute protection against disease. For a number of reasons, however, the boiling of milk has not become popular in this country, although in Europe it is almost a universal procedure, practically all the milk fed to infants and the greater part of that consumed by adults being treated in this manner. As a consequence milk-borne diseases are far less common there than with us.

Boiling produces changes in the color of milk, retards the rising of the cream, and brings about the development of a characteristic cooked taste. Raw milk is known to contain certain vital principles which are destroyed by boiling; the absence of these principles in boiled milk is supposed by some to be responsible for scurvy in infants who are fed exclusively on milk treated in this manner, although a much more common cause is the use of proprietary foods. Nevertheless the cases of scurvy in infants which can be traced to the use of boiled milk are extremely rare. Even when fully developed the disease is strikingly curable and it is altogether preventable by the addition of a little orange juice to the diet, so that it would seem to have but little weight against the more widespread adoption of boiled milk Inasmuch as boiled milk decomposes more rapidly than raw milk the milk should be boiled only in the home and not allowed to stand for more than a day or two before use.

Boiled milk is more constipating than raw milk and is therefore of considerable value in the treatment of diarrhea of both infants and adults. It is also more easily digested, the curds formed being smaller and softer than those of raw milk, so that it has certain advantages in the feeding of infants. For these reasons boiled milk is coming into much more general use. The single great advantage obtained from the use of boiled milk is, however, absolute freedom from the danger of contracting communicable disease. In milk which has been boiled for five minutes all organisms of a disease-producing character are killed and the supply is no longer capable of conveying the many infections which are transmitted by this substance. For these reasons boiling is to be recommended for all supplies which are suspicious as to quality and whenever there is an undue prevalence of any of the diseases mentioned. If this is done the danger of contracting disease through the use of contaminated milk altogether ceases.—(*Pub. Health Reports.*)

The War Mother.

You have given the world the best you had
  at the call of your country's need,
Part of your body and part of your soul
  For a cause that is now a Creed.
Lift high your head in a holy pride,
  In your gift that the world might live,
Pity the women who love their land
  And have no sons to give.

—Alice Britton Nichols.

War Medicine and Surgery

Some Surgical Developments in Wound Treatment During the War.

Colonel A. W. Mayo-Robson, of the British Army, says that at the present time the following distinct methods of wound treatment are being employed, and some of these have several or even numerous modifications:

1. Asepsis.
2. The treatment of septic wounds on general principles; free incision, removal of foreign bodies, thorough irrigation with or without antiseptics, and free drainage.
3. Antisepsis as introduced by Lister, and its modifications:

(a) The use of alcohol alone, no water or watery solution coming near the wound.

(b) The use of various more or less poisonous antiseptics, such as carbolic acid, mercury perchloride, mercury biniodide, iodin, potassium permanganate, eusol, flavine, chloramine-T, brilliant green, etc.

(c) The Carrel-Dakin treatment, the continuous use of a solution of sodium hypochlorite.

(d) Antiseptic pastes, such as treatment by bipp, introduced by Professor Rutherford Morison, or its modification by the use of other pastes.

4. Physiological treatment, introduced by Sir Almroth Wright, who uses a hypertonic salt solution. Arising out of the latter, but distinct from it, the salt pack, introduced by Col. Gray.
5. Surgical treatment—complete excision of the wound, including all contaminated parts and foreign bodies.
6. Bacteriological treatment, introduced by Dr. Donaldson and Major J. Leonard Joyce—that is, the introduction of a beneficient organism to kill the malignant germs.

Treatment on General Principles.

Aseptic surgery—that is, surgery carried out under the strictest and most rigid conditions of cleanliness—avoids the use of poisonous antiseptics such as carbolic acid and the mercury preparations, which it has been clearly proved damage the tissues and kill the living cells, which will themselves destroy any germs that might be accidentally introduced. For many years before the war Robson had carried out the principles of rigid aseptic surgery, and the satisfactory results obtained absolutely convinced him that the use of strong poisonous antiseptics was not only unnecessary but injurious in ordinary work, and during the war his experience confirmed his previous impressions. He, however, soon realized that with the exception of a few through-and-through wounds, all other gunshot injuries, especially shell wounds, were virulently septic, and required rigorous treatment by free incision and removal of bits of clothing and other foreign bodies, and by thorough irrigation with salt water or plain boiled water, or some mild antiseptic such as a weak permanganate solution, repeated as often as practicable, and free drainage. This led to the prevention of gas gangrene (at first a terrible scourge) and to good surgical results; it was the means of saving many lives or limbs that otherwise must have been lost.

The more efficient methods of treatment which enable wounds to be purified and closed at an early stage had not then been introduced. He was able to attain very fair results, and to put a stop to the practice of amputating in nearly all cases of gas gangrene.

When with the Mediterranean Expeditionary Force, Robson had the advantage of spending some little time on two hospital ships with Dr. Dakin, and of trying his solution on wounds before it had been generally adopted. He was then convinced that the hypochlorite solution, since known by his name, was the most efficient antiseptic hitherto employed, for while it was an active bactericide it apparently did not seriously damage the tissue cells.

Antisepsis.

Antiseptic surgery, introduced by Lister, but since modified and improved in many ways, aims at killing the germs already introduced into wounds, but the perfect antiseptic, which, while fatal to germ life, is not injurious to the living cells in the wound, has yet to be discovered.

The strong poisonous antiseptics, such as carbolic acid, mercury perchloride and biniodide, are now only used externally, to purify the skin, and they have in the hands of modern surgeons been replaced as a rule by milder nontoxic drugs, which are better bactericides and less injurious to the living cells in the wounds, from which help is sought in the healing processes.

The author's first experience of an antiseptic operation, long before Lister introduced his system, was in 1875, in Glasgow, and the case was one of amputation of the thigh for senile gangrene. After steeping the hands and instruments in spirit, the limb as well as the wound were washed in pure whisky and dressed with lint soaked in the same spirit. No drainage was employed. The wound healed by first intention, and the patient, a man of over 70, made a good recovery.

Where other means are not available, alcohol used in this way is most efficient, and as it is generally available in nearly every household, a surgeon need never be powerless for want of an antiseptic in the most out of the way place.

Two recently introduced antiseptics—flavine and brilliant green—we owe to work at the Middlesex Research Laboratory. Flavine used in a strength of 1 in 1,000 has been extensively advertised both in the lay and in the medical press, but it has not realized in practice all that has been claimed for it. It may be used to irrigate recent wounds or as a pack in large infected wounds, or it may be employed by means of Carrel's tubes instead of Dakin's fluid. Some surgeon's speak well of it. It is non-poisonous and non-irritating, but it stains everything a brilliant yellow. Although, as a rule, it tends to clean dirty wounds, in some cases it appears to retard healing by destroying the new epithelium at the wound margin and retarding the growth of granulation tissue, thus necessitating a change of dressing in the later stages of the case. The pathologists of various hospitals have reported that it is not an efficient bactericide, and in no cases is it safe to attempt the closure of wounds by suture after treatment by flavine, as is done in the Carrel-Dakin treatment.

Brilliant green is used in the same way as flavine, and has been especially useful in staining wounds as a preliminary to excision. It is spoken well of by many surgeons who have employed it in the treatment of war wounds.

Eusol is one of the most efficient antiseptics the surgeon can employ, and is closely allied to Dakin's fluid; it is easily prepared, keeps well in ordinary bottles and is non-poisonous. This chlorine preparation, unlike Dakin's fluid, is stable, and therefore available in situations where there is no chemist at hand to give a regular daily supply of freshly made lotion.

Chloramine-T is also an extremely useful antiseptic, coming under the same class as eusol and Dakin's fluid.

The ordinary antiseptic methods leave very much to be desired; as although, by free incision, removal of foreign bodies, thorough irrigation with some antiseptic and free drainage, virulent sepsis and gas gangrene can as a rule be effectually treated, the patient is left in many cases with enormous granulating wounds that take many weeks or even months to heal, leaving him a wreck constitutionally, and with enormous disfiguring and disabling scars, leading to deformity and rendering him unfit for military or other work.

Carrel-Dakin Treatment.

This modification of antiseptic treatment has been a real surgical advance, for in the course of a few days (from 5 to 14), if properly carried out, it usually renders septic wounds sterile, and enables them to be completely closed by sutures, thus doing away with the long-continued discharges of an ordinary granulating wound, and saving the patient from a wearisome and painful illness, ending in deterioration of health and deformities due to huge scars.

After meeting Dr. Dakin at the Dardanelles, and using his fluid successfully in numerous gunshot wounds, Robson met Dr. Carrel in France and had the opportunity of seeing the Carrel-Dakin treatment carried out in recent wounds as well as in cases already very septic. When carried out as the authors suggest it is most successful; but he says that in many hospitals where he has seen what professed to be the Carrel-Dakin treatment it was anything but successful as the fluid was not carefully or freshly prepared, the surgeons did not carry out the after-dressings personally and the aid of a pathologist was not obtained.

In the French hospitals the solution is carefully tested by skilled chemists, the operative technique and the after-dressings are carried out by the surgeon himself with as much care as in any aseptic operation, and the discharges are regularly examined by a skilled pathologist. So soon as the wound fluids are sterile or are found to contain only one or two germs in several microscopic fields the wound can be completely closed from end to end by sutures and it heals like a primary operation wound.

The multiple irrigation tubes, perforated along their whole length, 4 mm. calibre and 30 cm. long, are inserted into the depths and recesses of wounds, and enable the nurse to flush the wound with a little of the solution every two hours by means of a clip on a tube leading from a glass reservoir suspended over the patient. In this way the wound is kept constantly bathed with the Dakin solution and the pathogenic germs are destroyed and prevented from developing.

The appearance of the patients thus treated is very striking, they have a clear complexion, are free from pain, have no rise

of temperature, have a good appetite and with few exceptions, even the most extensive and foul wounds become sweet and clean and can be completely closed by suture within a fortnight or even earlier in some cases. A great disadvantage is the difficulty of carrying out this treatment during transport, which has given a very wrong impression to surgeons working in England, as the cases often arrive in a very foul condition and compare unfavorably with those treated by salt packs or by "bipp."

Antiseptic Pastes.

The antiseptic paste called "bipp" from the initials of its components—bismuth, iodoform and paraffin—was introduced by Prof. Rutherford Morison, and as a primary or secondary dressing in gunshot injuries has proved to be most effective. Cases treated with it can be transported safely without fear of becoming septic from want of dressing during the journey, and in this respect it has advantage over the Carrel-Dakin treatment.

Bipp can be used in cases treated by the Carrel-Dakin method for a few days, and when the wound is not yet absolutely sterile the use of the paste enables it to be safely closed by suture, thus saving time and trouble to the patient and attendants. Capt. Hey prefers a paste without bismuth or iodoform but containing brilliant green, boric acid, French chalk and liquid paraffin, which he uses with great confidence after excision of the infected part as a primary measure, or after the Carrel-Dakin treatment as a secondary procedure. His results closely resemble those obtained by the use of bipp.

Physiological Method.

Sir Almroth Wright is an opponent of antiseptic surgery, and suggested the use of hypertonic saline solution—the so-called "physiological treatment," which, he claims, draws out from the tissues of the wounds an abundant fluid containing cells, which attack and destroy the germs of disease; and that these, together with bits of dead tissues and dead cells are carried away by the free outpouring of fluid. A dressing wet with the hypertonic saline solution must be left in the wound or the wound must be kept constantly irrigated with the fluid. The chief merit of this treatment lies in the fact that it helped to break the spell which had bound surgeons to antiseptics in the treatment of wounds essentially septic.

Out of this method Col. H. M. W. Gray evolved the "salt-pack" treatment to promote a so-called lymphagogue action, thus obviating the need for drainage or continuous irrigation. The great merits of the salt pack lie in the ease with which it can be applied, and in the fact that it can be left *in situ* for several days without renewal, thus saving the patient the distress and pain of frequent dressings; that it accomplishes all the changes which Sir Almroth Wright insists upon as being necessary for the successful cleansing of a wound from infection, and that its effects are not interfered with by the transport of the patient.

Although the bacterial flora of the wounds treated by the salt pack are numerous and the discharges are offensive, the wounds do well as a rule, become clean, are speedily covered by healthy granulations, and heal rapidly; moreover, wounds treated by salt packs are extraordinarily free from secondary hemorrhage.

The process is simple in the extreme. After opening up and purifying the wound as far as possible, the salt packs are placed in it, and over all an absorbent dressing; as the dressing does not need renewing for some days, the saving of time to the attendants is very considerable.

Hitherto the good results have been attributed in some obscure way to the salt acting more or less on the physiological lines suggested by Wright, but all who have witnessed the employment of salt packs have felt that some other explanation is necessary.

The Surgical Method.

In gunshot injuries, besides the introduction of pathogenic organisms, there is in every case actual destruction of tissue by the force of entry of the projectile; there is necessarily, therefore, a varying amount of dead or devitalized tissue present. It is in this that the organisms elaborate the poisons, and it is from this source that the toxins enter the system. If the dead tissues can be removed the source of the poison is taken away. The strong antiseptics, which aim at killing the germs in the wound, only effect their purpose partially and slowly; not only do they fail to remove the dead tissue which is the breeding ground, but they produce more by their destructive effect on the living cells. Even under the continuous application of the Carrel-Dakin method, from five to fourteen more days are required before the wound is rendered sterile.

The physiological method, which relies on the living cells throwing off the dead tissues and destroying the pathogenic organisms, is long and uncertain in its action; moreover, while dead tissues remain they are a source of danger and capable of again lighting up fresh mischief. Hence the tendency of surgery now is at as early a stage as possible to excise the whole of the infected area—or, in other words, the dead and damaged tissues. But in doing this it inflicts a fresh injury, often very extensive and one liable to re-infection.

Capt. Wilson H. Hey says that the case for complete excision should begin and end all discussions on the wounds of war; without it good antiseptics and pastes are almost useless. He stains the whole of the wound with brilliant green, and, if possible, excises the wound without allowing the knife to enter the wound cavity; the wound is pasted and primarily sutured in some cases, but in others, especially where a complete primary operation cannot be done, every trace of stained tissue is excised, the wound is dried throughout with spirit, and the paste rubbed into the tissues, and with all thoroughness into every recess. When all is going well the dressings are not disturbed for two or three days, and if the smear counts average only 0.2 to 2.0 per field the wound may be sutured on the third to the fifth day. Where progress is unfavorable the wound is repasted, or further operative measures may be required under anesthesia; in some cases hot fomentations are used and suturing is only performed at a later stage.

It will be seen that this method, which is only available if the case is seen early, and involves a more or less severe operation, not only saves much time in the healing of the wound but also saves the patient from the dangers of sepsis and secures a more or less linear scar. This treatment should only be carried out by a skilled surgeon, otherwise material deformity may be inflicted if the wound be extensive.

Bacteriological Treatment.

The bacteriological treatment of wounds is the result of very interesting work carried out at the Reading War Hospital by Dr. Robert Donaldson and Major J. Leonard Joyce, in septic wounds of all kinds arriving from the front at various periods after the injury has been inflicted.

Major Joyce, who is a strong advocate of the salt-pack treatment, noticed that under this treatment the wounds that were doing well emitted a powerful and offensive odor, and those not doing well were devoid of smell.

The observers found in the offensive discharges of the cases that did well an oval sporing bacillus which was absent from the cases not doing well, and they ultimately isolated it in pure culture. This organism, when introduced into a fresh meat-broth tube and incubated at 37° C. anerobically, in two or three days emitted the characteristic wound odor and the meat began to blacken and diminish in volume, indicating active proteolysis. This at once suggested the part possibly played by the bacillus in wounds—namely, that it did in the dead wound tissues what it appeared to do in the glass tube—that is, it digested them.

As the organism was found to be non-pathogenic to animals and as the fluid in which it was grown contained no elements toxic to animals, it was considered safe, after thorough irrigation and purification, to introduce it into wounds that were not doing well under salt packs; with the result that the characteristic odor soon developed, the temperature came down, the patients became comfortable, and in a few days the wounds became clean, devoid of sloughs and covered with healthy granulations.

The question then arose as to the part played by the salt, and it was found that the wounds containing the anerobic germs (now called the Reading bacillus) did as well when sphagnum moss replaced the salt; in fact the idea that the salt has any specific value is exploded.

Thus a point has been reached in which can be recommended a treatment which involves the simplest technique, the simplest and cheapest of dressings (for salt or sphagnum moss can easily be obtained) and the least disturbance to the patient. It does away with the need for frequent dressings and the mental and physical sufferings entailed thereby.

In order to ensure success, however, it is necessary that the organism or its spores be present, and although it frequently is, it cannot be depended on to be present. Hence in such cases the wound ought to be sown with the organism at the time of packing.

In treating wounds by this method it is important to lay them freely open, every pocket being dealt with, all foreign bodies removed, and any grossly damaged tissue taken away. The wound must then be irrigated with sterile water or saline solution and the pure culture of the Reading bacillus introduced by means of a pipette. The packing of salt or sphagnum moss moistened with sterile water is then introduced into the wound so as to bring it into contact with every part, over this several layers of plain moist gauze are laid, and over all a thick layer of cotton-wool, after which the whole is bandaged firmly. A splint is an additional advantage.

If all is going well, as shown by the general condition, the

pack is left in for about seven days (about the third day the characteristic odor will develop), when it can be removed and the granulating wound irrigated with warm normal saline or eusol solution, after which a healthy wound only requires treatment, and either by the Carrel-Dakin method or by the use of antiseptic paste it can soon be closed by suture.

SELECTION OF METHOD.

In cases seen at the front the first duty of the surgeon in all shell wounds is to lay the wound fully open, including every pocket, to remove all foreign bodies and bits of clothing as well as loose particles of bone and dead or damaged tissue, to arrest bleeding, and to irrigate the wound thoroughly with some antiseptic such as eusol or Dakin's fluid, or hypertonic saline or alcohol—in fact, to treat the case on the general principles well known as suitable for poisoned wounds; this, followed by free drainage, was the method carried out with more or less success in the early months or first year of the war.

Now, although this led to saving of life and to abolishing violent sepsis and gas gangrene, it left large wounds to heal by a long process of granulation, and led to exhaustion of vital powers and to deformity caused by large scars. Now, however, we have several methods to choose from to shorten the treatment subsequent to the first necessary operation.

(a) The Carrel-Dakin treatment, with closure of the wound in from a week to a fortnight, is, if the case can be got shortly to a good hospital and kept there, the ideal method, and it has certainly given excellent results, but it is not good for cases that have to be transferred by sea and rail.

(b) If the patient has to be transferred—as, indeed, have the greater number of cases—after cleansing the wound and drying it with alcohol, the bipp treatment with closure of the wound affords an excellent method; this is especially the case if the wound has been completely excised, when either bipp or the paste recommended by Capt. Hey can be used.

(c) The salt-pack treatment used by Col. Gray is excellent both for transport and subsequent treatment, to be followed in about a week or more by the Carrel-Dakin or bipp methods.

(d) For the care of septic suppurating wounds arriving constantly at the base hospitals both in France and in England, the pathological method followed out at Reading of grafting the purified wound with the Reading bacillus under packs of sphagnum moss is both simple and effective, and the experience there is that secondary hemorrhage has never occurred under this treatment.—(*Brit. Med. Jour.*, Jan. 5, 1918.)

The Physician's Library

Genito-Urinary and Venereal Diseases. By Edwin Martin, A. M., M. D., F. A. C. S., Benjamin A. Thomas, A. M., M. D., F. A. C. S., and Stirling W. Moorhead, M. D., F. A. C. S. Cloth, 929 pages. 10th edition. Illustrated with 422 engravings and 21 colored plates. $7.00. Phila. and London, 1917: J. B. Lippincott Co.

This leader in the literature of genito-urinary surgery appears for the tenth time, still as White & Martin's work, but with two younger men as associates. The book has been enlarged, rewritten and is up to the minute in the exposition of the art and science of urology. Some of the fads have been omitted and the material published bears the hallmark of substantialness. There is little to criticize and much to praise in this book. Not the least valuable is the section devoted to syphilis, which includes practically one-fourth of the volume.

We recall no saner presentation of this great subject in any text book. Indeed it warrants independent publication on account of the excellence of the text and the thorough manner in which the diagnosis and treatment of the disease is handled.

A comparison of earlier editions with the present reveals the great advance in laboratory technic in urology and syphilis and this important phase has been given its necessary place in these pages.

The illustrations really illustrate and the general typographical appearance leaves little to be desired.

Neurosyphilis, Modern Systematic Diagnosis and Treatment. Presented in One Hundred and Thirty-seven Case Histories. By E. E. Southard, M. D., and H. C. Solomon, M. D., of Harvard Medical School and Boston State Hospital, etc. Octavo, 500 pages, with 25 full page illustrations, $5. Boston: W. M. Leonard, 1917.

We are recognizing more and more the value of the study of case histories. This book appeals particularly to the general practitioner, although the specialist may regard it as his own. The devious byways and highways of neurosyphilitic diagnosis are firmly trodden by the authors, who lay down axioms that we must accept until new prophets arise.

The authors give among many other statements which seem logical this fact, "No one can now successfully make a differential diagnosis between the paretic and diffuse non-paretic forms of neurosyphilis in many phases of either disease, even with all the laboratory refinements." Therefore they believe it is proper to "give the full benefits of modern treatment to all cases in which the diagnosis remains doubtful." The cases portrayed are of intense interest and warrant much study on the part of general practitioners. They point out to a startling degree the value of salvarsan and mercury in the treatment of syphilis.

The Health-Care of the Baby. A Handbook for Mothers and Nurses. By Louis Fischer, M. D., author of "Infant Feeding in Health and Disease," "A Text-Book on Diseases of Infancy and Childhood," and "The Health-Care of the Growing Child." Attending Physician to the Willard Parker and Riverside Hospitals. Cloth, 182 pages. 85 cents. New York: Funk & Wagnalls, 1918.

The tenth edition is almost a new book as it has been rewritten and much material of value has been added. The author, who is one of America's leading pediatrician's, has set forth an enormous amount of practical information in most understandable language. Mothers in particular will find this little volume an ever present help in the solution of their varied baby problems.

Impotence and Sterility. By G. Frank Lydston, M. D. Cloth. 331 pages. $4.00. Chicago: Riverton Press, 25 E. Washington Street, 1917.

The original work done by Lydston in sex gland implantation is reason sufficient for the publication of this monograph, which vividly sets forth the details and results of his researches. In addition he has given a short but excellent dissertation on diseases and aberrations of the sex function, again placing these peculiar conditions before our eyes and compelling recognition of their presence and the necessity of their better understanding.

Human Physiology. By A. P. Brubaker, M. D., of Jefferson Medical College. 14th edition. $1.25. Philadelphia: P. Blakiston's Son & Co., 1917.

This time honored compend has been thoroughly revised and serves its useful purpose better than ever. The medical reader who desires to refresh his physiological memory will be glad to consult the authoritative pages of this book.

Complete Index to Musser and Kelly's Practical Treatment. Philadelphia: W. B. Saunders Co., 1917.

Those who have this splendid four-volume set, and they should be very many, will desire this index. It is thorough and being cross indexed, is most essential if one desires to get the most out of the series.

War Activities

Army Psychological Examinations.

The Chief of Staff has approved the recommendation of the Surgeon General for the extension of psychological examination to all enlisted men and all newly appointed officers of the army, and has approved plans for carrying out these examinations. The work will require four commissioned officers and twenty enlisted men per division in order to examine 400 men a day—more enlisted men if a larger number is to be examined each day. The total estimated personnel for conducting the examinations in the thirty-one divisional training camps and for special staff in the Surgeon General's office is twenty-seven majors, fifty-one captains and fifty-four first lieutenants of the Sanitary Corps, National Army, and sixty-two sergeants, sixty-two corporals and 620 enlisted men. Special buildings and equipment to cost $10,000 to $12,000 per camp have been authorized for the work.

A school of military psychology will be established at the medical officers' training camp at Fort Ogelthorpe, Ga., where about fifty psychologists will be entered monthly for a minimum of two months' training in the subjects which they should know for the practice of their specialty under military conditions. On the staff of the commandment of the medical officers' training camp will be a senior instructor in psychology detailed to the work by the Surgeon General on recommendation of Major Robert M. Yerkes, head of the section of psychology. General military and physical instruction will be given students and, in addition, such instruction in military psychology as the organization and administration of psychological examining, the practice of group and individual examining, types of mental incompetents, malingering and its detection, etc.

(*Continued on p.* 22)

IN PULMONARY AND RESPIRATORY AFFECTIONS

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(From note of acceptance by Council on Pharmacy and Chemistry of Amer. Med. Association — Jour. A.M.A. Sept. 15. 1917)

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Boston, Mass.

(*Continued from p.* 88)

The extension of the psychological examinations is based on results in four divisional camps where the method was tried. By order of the Surgeon General special inspection of this work was made at two of the camps where the work was in progress, Camps Lee and Devens. Col. Henry A. Shaw, M. C., U. S. A., who was detailed to make this inspection has made a special report on this work, in the course of which he says:

"The value of these psychological tests as an indication of mental capacity cannot be definitely determined at present; further comparison must be made of officers' estimates and the performance of the men with psychological scores. The general opinion at Camp Lee is dictinctly favorable and I am confident that the results obtained by Lieutenant Yoakum and his co-workers amply justify the extension of the examinations to include all enlisted and drafted men and newly appointed officers. There is nothing novel or experimental in the principle of applying psychological tests as a means of determining practical every day mental capacity. They have been repeatedly made use of heretofore among big business concerns with results indicated in dollars and cents saved. The value of the work of Major Yerkes and his assistants consists in devising mental tests of such a nature as to serve as a practical index of the intelligence of men in the military service. If the results of the work at Camp Lee are borne out at other places, it must be admitted that Major Yerkes has been eminently successful."

Major General Adelbert Cronkhite, N. A., is also quoted as expressing an opinion in regard to the value of these examinations and how it will operate in his division. General Cronkhite wrote: "It may be revolutionary, but the psychiatric board's intelligence tests will play a great part in this division. These tests are virtually conclusive; they have proved so in thousands of cases. And men who show a high intelligence rating will be watched closely—will be given every chance for advancement. Their daily work will be taken into consideration, and if they deserve promotion they'll get it. This is the program from top to bottom, officer and private."—(*A. and N. Jour.*)

Army Medical Training Camps.

Extensions are being made in the scope of the medical training camps at Fort Oglethorpe, Ga., and Fort Riley, Kans., by the addition of courses in specialties required of the Medical, Sanitary and Veterinary Corps under Major Gen. William C. Gorgas. There are at present 5,400 officers and men under training at Fort Oglethorpe and 3,800 at Fort Riley. Fort Riley has a capacity of 7,000. Enlargement of the school at Fort Oglethorpe to the same capacity has been authorized, its present capacity being 5,500. The ultimate needs of the Medical Department of the Army look to training camps of capacities totaling 45,000 to 40,000 officers and men. There have been graduated from medical training camps since June 1, or are now under instruction, a total of about 9,000 officers and about 20,000 enlisted men. Until December 1 the medical training camp at Fort Benjamin Harrison, Ind., and the one at Fort Des Moines, Iowa, for colored officers and men, had been contributing to the total, but these camps have been discontinued.

Ten new sections have recently been, or are now being, established for officers in the medical training camps. These are for the following: *x*-ray specialists, orthopedic surgeons, psychologists, special examining surgeons, sanitary engineers, veterinarians, sanitarians, hospital administration, laboratory specialists (being established), and dental surgeons (being established). Consideration is being given to plans for the establishment of three additional courses; one in general military surgery, one for genito-urinary surgery and one for military surgery of the brain, head and face. Various special groups now in active service have been trained since the opening of the schools. These include officers and men to operate ambulance companies, field hospitals, evacuation hospitals, base hospitals, hospital trains, etc.

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